



Jane's
POCKET GUIDE
**MODERN MILITARY
HELICOPTERS**

TIM RIPLEY

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HarperCollins Publishers

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Introduction

"Death from Above" was the famous insignia on the nose of Lieutenant Colonel Kilgore's UH-1 Huey gunship in Francis Ford Coppola's Vietnam War epic *Apocalypse Now*. The 25-minute long section of the movie where the UH1h 'Air Cav' take a Vietcong-held village to the sound of Wagner's *Ride of the Valkyries* captured perfectly the essence of going to war by helicopter.

Since the Vietnam War the helicopter has been an integral part of every armed force, and rotary-winged aircraft have seen action in every major conflict and many small wars. This rapid acceptance of helicopters into the mainstream of military organisations in attack, reconnaissance, liaison, transport, medical and maritime roles has led one commentator to term them 'rotary-winged fighting vehicles'.

However, when helicopters first saw action during the Korean War, they were used by US armed forces for casualty evacuation and VIP transport only. Indeed, it was left to the French to first demonstrate the combat potential of the armed helicopter during their colonial conflict in Algeria. The 1950s and 60s also coincided with revolutionary developments in helicopter design, such as the tandem rotor and turboshaft powerplants.

The success of US Army and Marine Corps gunships in Vietnam spurred the Soviet, British, French, Italian, Israeli, German and numerous other armed forces to field their own fleets of helicopters for anti-tank and assault work. By the mid-1970s most armies had begun programmes to procure specialist attack helicopters, leading to the development of the

current generation of Cobras, Apaches, Tigers, A 129s, Mi-24s, Ka-50s and Rosovalks. It must be duly noted that these developments were often made in the face of stiff opposition from air force 'blue suiters', who saw the armed helicopter as a direct rival to their own fleets of fixed-wing close air support aircraft.

No such argument was put forward by the navies of the world, however, as they had been quick to embrace the armed helicopter for the anti-submarine and anti-surface vessel roles, as well as more conventional air transport duties.

Indeed, the 1982 Falklands War proved the worth of the helicopter in naval warfare, protecting the British fleet from Argentine submarine attack, decoying Exocet missiles with electronic jamming devices and sinking enemy shipping with guided missiles. Five years later US Army and Navy helicopters provided vital protection against Iranian fast patrol boats in Persian Gulf.

The 1991 Gulf War saw helicopters employed successfully in a wide range of roles by Coalition forces, whilst in the aftermath of the conflict, multi-national relief efforts to help Kurdish refugees in Northern Iraq depended on helicopters to fly in supplies to remote mountain camps.

In the post-Cold War world, humanitarian aid and peacekeeping missions have seen ostensibly military helicopters put to extensive use. Media images of United Nations relief operations in Somalia, Haiti, Rwanda, Bosnia and elsewhere are dominated by swarms of helicopters. NATO peace enforcing missions in Bosnia have seen the Apache

attack helicopter intimidating local forces into keeping the peace.

From a communist standpoint, Soviet forces used helicopter gunships to great effect during their long conflict in Afghanistan from 1979 onwards. The simple, but rugged, Mi Mi-8 and Mi-24 assault helicopters became familiar images on snatched footage shot by western television crews covering with the Mujhadeen guerrillas at the bottom of parched Afghan valleys. In 1994 Russian helicopters were again in action against Islamic guerrillas in Chechnya. Combat helicopters from the former Soviet Union are much in demand because of their low cost and reliability. Proof of this has come very recently when, in a remarkable vote of faith in their former opponents' equipment, the South African-based mercenary organisation Executive Outcomes has become a regular user of Mi-8 and Mi-24s during its operations in Angola and Sierra Leone.

This Jane's guide aims to describe the major combat helicopters in service today, or in the final stages of development. We have classified combat helicopters as rotary-winged aircraft designed specifically for military use, or civilian machines adopted for use by military forces.

Increasingly, armed forces are making use of chartered civilian helicopters as a means to cut costs, and we have enclosed the types used by contractors in this study, particularly those chartered by the United Nations for humanitarian and peacekeeping missions.

We also take note of a number of major changes in the

helicopter industry. For example, the consolidation of helicopter manufacturers into a smaller number of larger companies is reflected in the usage of new company titles. We have, however, included details of what are termed 'heritage companies' for reference. As a rule, we have used the current name of the manufacturer, or last name manufacturer before production ceased.

The opening up of the Russian defence industry since the demise of the Soviet Union has meant that it is now possible to attribute long-established designs to their real manufacturers, rather than just link products to design bureau (known as OKB). Actual Russian helicopter and weapon designations are also used to supplement NATO reporting names.

Helicopter production continues around the world in large numbers in spite of the general down turn in global defence spending. This trend will continue as combat helicopters continue to be in the forefront of military thinking and actual operations well into the 21st Century. New technical developments such as the introduction of tilt rotors and advanced compound helicopters also offer military helicopter users significant improvements in both performance and operational capabilities.

Tim Ripley

Lancaster, October 1997

Aerospatiale Alouette II (France)

Type: Light helicopter

Accommodation: One pilot; four passengers

Development/History

After its first line in 1955, the Alouette II became the world's first turboshaft powered helicopter to enter production.

Variants

SE 3120: Two-prototype Alouette IIs, powered by the 258 kW (350 shp) Turbomeca Artouste I turboshaft.

SE 3130: Designation after Sud-Est merged with Gerd Aviation in 1957, later re-named Sud-Aviation.

SE 3140: Alouette II development powered by a 258 kW (350 shp) Turbomeca Artouste II engine, first order produced.

SA 3160: Alouette II derivative powered by the more economical Artouste IIIA with a new centrifugal clutch.

SA 318C: Production version of SA3160.

SA 316B Lanza: Powered by Turbomeca Artouste IIIA.

Assembled in India (Chivrit) and Brazil (HB 316B Goloso).

Status

French production ended 1976. Indian production continues.

Operators

Argentina, Belgium, Benin, Bolivia, Cameroon, Chile, Congo, Ecuador, El Salvador, Dominican Republic, Germany, Guinea-Bissau, India, Lebanon, Namibia, Senegal, Somalia, Togo, Tunisia.

Manufacturers

Sud-Est/Sud-Aviation/Aerospatiale (France), Hindustan Aeronautics Ltd (India), Holland-Dassault, Saab (Sweden), Republic Aviation (USA).



Aerospatiale Alouette II

(Tim Ripley)

Specifications (for SA 318C)

Powerplant

One Turbomeca Artouste IIIA turboshaft

Power: 330 shp (245 kW) derated to 300 shp (220 kW)

Dimensions

Length: 39 ft 8 in (12.03 m)

Rotor diameter: 33 ft 5.6 in (10.20 m)

Height: 9 ft (2.75 m)

Weights

Empty: 1951 lb (885 kg)

Max MTOW: 3026 lb (1375 kg)

Payload: 1223 lb (555 kg)

Performance

Max speed: 127 mph (205 km/h)

Range: 300 nm (570 km)

Armament

AS11 and 12 mm-gauged anti-tank missiles, four-flight rockets, machine guns

Aérospatiale Alouette III (France)

Type: Light helicopter

Accommodation: Two pilots, five passengers

Development/History

The best-selling Alouette III grew out of the smaller Alouette II, the first prototype flew in 1958 and rapidly became a best-selling machine with 2,262 built and 74 countries operating the helicopter at the height of its popularity. Originally intended for service with the French armed forces in Algeria, this conflict came to an end before it was in widespread use. Portuguese, Rhodesian and South African forces used the helicopter extensively in their long tough wars with Nationalist guerrillas throughout Southern Africa. It has been used extensively in conflicts on the Indian sub-continent by Indian and Pakistani forces, performing well in the high Himalayas. Versions have been used for rescue, observation, attack, assault transport, anti-submarine warfare, anti-surface warfare, anti-aircraft, combat search and rescue, counter-insurgency and armed reconnaissance work.

Switzerland, later Aerospatiale, were keen to use French production deals to foster business relationships in the Eastern Bloc and Third World. They were one of the first western aviation companies to offer technology transfer and work on the Alouette family helped establish the Indian, Romanian and South African helicopter industries.

Variants

SA 3100: Alouette III powered by one 649 hp (870 shp)

Turbomeca Artouste IIIA turboshaft, de-rated to 400 kW

(550 shp).

SA 310A: Production version of SA 3100.

SA 3160: Featured strengthened main and tail rotor to allow



Aérospatiale Alouette III

(Tim Ripley)

Specifications (for SA 319B)

Powerplant

One Artouste IIIA turboshaft

Power: 870 shp (643 kW) de-rated to 660 shp (447 kW)

Dimensions

Length: 25 ft 4 in (7.7 m)

Rotor diameter: 35 ft 1 in (10 m)

Height: 9 ft 9 in (2.9 m)

Weights

Empty: 2420 lb (1100 kg)

Max TOW: 4020 lb (1810 kg)

Payload: 1650 lb (750 kg)

Performance

Max speed: 130 mph (210 km/h)

Range: 335 nm (610 km)

Armament

AS12 guided missiles, Mk 44 ASW torpedoes, machine guns (fixed or door mounted), two-flight rocket pods

Aerospatiale Alouette III (France)



Aerospatiale Alouette III of Royal Netherlands Air Force

(Tom Ripley)

for greater performance. Produced in Romania as IAR-316B and in India as Chetak.

SA 316C: Artouste IIIA powered variant built in limited numbers.

SA 316B: Direct development of the SA 316B, powered by a more efficient and more

economical 440 kW (595 shp) Turbomeca Artouste IIIA (upgraded), developed to 447 kW (600 shp).

G-Car: Rhodesian Air Force gunship version with two side-mounted Browning machine guns. Gunship with single port firing 20 mm

Mauser cannon in cabin known as G-Car.

MR-317 Skyfox: Prototype Romanian gunship version, armed with anti-tank missiles, low-fall rockets and machine gun pods which did not enter production.

Atlas Aviation RH-1 Alpha: South African weapons system demonstrator for Bushnell attack helicopters.

Status

Production in France ceased in 1983 after 1455 built. Some 230 built in Romania until 1985. Limited production continued only in India, with 300 built to date.

Operators

Algeria, Angola, Argentina (navy), Austria, Belgium (navy), Bahrain (navy), Bangladesh, Cameroon, Chad, Congo Republic, Ecuador (air force), Equatorial Guinea, France (army/navy/air force), Ghana, Greece (navy), Guinea, Guinea-Bissau, India (army/navy), Iraq, Ireland, Jordan, Lebanon, Libya, Malaysia (army), Mexico (navy), Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, Nicaragua, Pakistan (army/navy/air force), Peru (army/navy/air force), Portugal, Romania, Rwanda, South Africa, Switzerland, Togo, Tunisia, UAE, (Alas Dhah), Venezuela (navy), Congo (Congo Zaire) and Zimbabwe.

Manufacturers

Sud-Aviation/Aerospatiale (France), ICA (navy) (Romania), Federal Aircraft Factory (Switzerland) and Hindustan Aeronautics Ltd (India).

Aerospatiale Super Frelon (France)

Type: Heavy lift helicopter

Accommodations: Two pilots, up to 37 passengers

Development/History

First flown in the 1962 to meet French Navy requirements for a medium lifting helicopter armed with anti-ship guided missiles and ASW weapons. Some remain in French service for logistic support and vertical replenishment at sea.

Variants

SA 320: Pre-production aircraft
SA 3210: French ASW version, later able to fire Exocet
SA 3210a: French navy cargo carrying and assault transport
SA 3210M: Export version for Libya
SA 321F: Chinese version
SA 321H: Version sold to Iraq with Turbomeca engines, Omega DRB-310 rotor and Exocet missiles.
SA 321L B Jr: Civilian version.
SA 321K: Export transport version to Israel.
SA 321L: Export Harpoon version to South Africa.
SA 321M: Export transport/rescue version to Libya.
Changhe Z-16: Chinese-built naval and combat version.

Status

Production continues in China only.

Operators

France (now), China (now), Iraq and Libya.

Manufacturer

Sud-Aviation/Aerospatiale (France) and Changhe Aircraft Factory (China).



Aerospatiale SA 321 Super Frelon

(Tim Ripley)

Specifications (for SA321G)

Powerplant

Eng: Turbomeca Turmo IIIIC turboshafts

Power: 4710 shp (3540 kW)

Dimensions

Length: 62 ft 7 in (19.4 m)

Rotor diameter: 62 ft (18.9 m)

Height: 16 ft 2 in (4.9 m)

Weights

Empty: 15 100 lb (6863 kg)

Max lift: 28 000 lb (13 000 kg)

Payload: 11 021 lb (5000 kg)

Performance

Max speed: 171 mph (275 km/h)

Range: 440 nm (820 km)

Armament

ASW weapons; depth charges; machine guns.



Eurocopter Ecureuil/Fennec (France)



AS 3004 is service with the Australian Army.

A9 **or** I turned back to it as I was about to leave.

44. (2012) Suppose f is a real function with the following properties:

- f is differentiable at $x = 0$ and $f'(0) = 1$.
- f is continuous at $x = 0$ and $f(0) = 0$.

Find the value of $\lim_{x \rightarrow 0} \frac{f(x)}{x}$.

Abstract—The authors examined the relationship between the use of a computerized decision support system (DSS) and the use of a decision tree (DT) in a diagnostic task. The authors hypothesized that the use of a DSS would lead to a more efficient use of a DT. The results of the study showed that the use of a DSS led to a more efficient use of a DT. The authors concluded that the use of a DSS can improve the efficiency of a DT in a diagnostic task.

Abstract The purpose of this study was to determine the effect of a 12-week training program on the physical fitness of 10-year-old children. The study was conducted in a primary school in the city of Bursa, Turkey. The study group consisted of 20 children (10 boys and 10 girls) who were randomly selected from the 10-year-old children in the school. The children were divided into two groups: a control group and an experimental group. The control group did not participate in any physical education program, while the experimental group participated in a 12-week training program. The physical fitness of the children was measured at the beginning and at the end of the 12-week period. The measurements included heart rate, blood pressure, and body mass index. The results of the study showed that the experimental group had significantly higher heart rates and blood pressures at the end of the 12-week period compared to the control group. The body mass index of the children in the experimental group also increased significantly. These findings suggest that a 12-week training program can improve the physical fitness of 10-year-old children.

doi:10.1017/S0022292412001609

AS 5558 Street East—original version; AS 5558B curve
to the north on own tracks; AS 5558C bridge, old middle
version; AS 5558A second original version; AS 5558B
second, not added version; AS 5558B with a version; AS
5558B third, fully version; AS 5558B unchanged road
to the north, 1950s to 1960s, 1960s, 1960s

E-14: Choose preferred copy no. in Ref AD Receipts-L, third + last copy (date, copy)

ASPH 555P: High Temp Polymer Degradation Ch 15 and 16-5 + 1 week 16. In Section air mass 146-200 by first line mass

James Haggerty, 44, is a former member of the FBI. He was arrested in 1997 on charges of conspiracy to commit murder and kidnapping.

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Observations

Argentina (from grass), Bolivia (from grass, shrub, etc. forest),
Brazil (Bathurstia, from grass, shrub, etc. forest), Cuba (from grass),
Ecuador (from grass), El Salvador (from grass, shrub, etc. forest),
France (from grass, shrub, etc. forest), Scotland (from grass, shrub, etc. forest),
Spain (from grass, shrub, etc. forest), Sweden (from grass, shrub, etc. forest),
Switzerland (from grass, shrub, etc. forest), Turkey (from grass, shrub, etc. forest),
U.S.A. (from grass, shrub, etc. forest), Venezuela (from grass, shrub, etc. forest).

[Manulife.com](http://www.manulife.com)

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 Barbara Brown, David Brown, and the staff of the

 University of California, Berkeley, for their

 assistance in the preparation of this manuscript.



Eurocopter AS 550 C5 Fennec

Eurocopter

Eurocopter Puma (France)

SA 330B Helicopters on air view in 1993 - rotor for main rotor and tail rotor and fuselage structure
 AB 330A Helicopter with rotor, fuselage structure and rotor
 AB 330B Helicopter with rotor and fuselage structure
 AB 330B Helicopter with rotor and fuselage structure
 AB 330B Helicopter with rotor and fuselage structure
 AB 330B Helicopter with rotor and fuselage structure
 AB 330B Helicopter with rotor and fuselage structure

Status

Medium-sized helicopter only in Romania

Operators

Argentine (Buenos Aires), Brazil (Rio de Janeiro), Chile (Santiago), Colombia (Bogotá), Ecuador (Quito), France (Paris), Germany (Munich), Greece (Athens), Hungary (Budapest), India (New Delhi), Italy (Rome), Japan (Tokyo), Korea (Seoul), Mexico (Mexico City), Norway (Oslo), Poland (Warsaw), Portugal (Lisbon), Romania (Bucharest), South Africa (Cape Town), Spain (Madrid), Sweden (Stockholm), Switzerland (Zürich), Taiwan (Taipei), Thailand (Bangkok), Turkey (Ankara), United States (Washington, D.C.), United Kingdom (London), Venezuela (Caracas), Vietnam (Hanoi), Yugoslavia (Belgrade)

Manufacturer

Boeing-Boeing Helicopters (France), Boeing-Boeing Helicopters (France), Boeing-Boeing Helicopters (France), Boeing-Boeing Helicopters (France), Boeing-Boeing Helicopters (France), Boeing-Boeing Helicopters (France)





Eurocopter AS 532 UL Cougar (Hk 1 with Horizon battlefield surveillance system)

Eurocopter

Eurocopter Super Puma/Cougar (France)

AS 332 Cougar Mk 2: Search and rescue with 100 kW 7.0 t hoist. Mobile AS transport, medical evacuation, deployment Super Puma E: in-flight refueling system, AS 332A2 armed combat version with AS 332A2 mounted a fully air-to-surface package. AS 332B2 armed and reconnaissance

Cougar: 300. Modular capabilities support version AS 332L, HORIZON: ground surveillance version developed from Chinook system

NAS 332B: reconnaissance and detection

NAS 332: Indonesian naval designation

CH-34: Brazilian designation for 332B

MT-7: Spanish Army designation for 332B

MD-2: Spanish Air Force search and rescue designation

MT-10: Spanish VIP designation

-Rq: 30: Swedish search and rescue designation

Status

In production in various configurations

Operators

Argentina (armed guard, army), Brazil (military forces), Cameroon (air force/military force), China, Congo (force), Côte d'Ivoire, Ecuador (force and army/air force), Qatar (military/military force), Iraq, Japan, Jordan, Kuwait, Malaysia, Mexico (air force), Africa (air force), Nigeria (force), Oman (army), Saudi Arabia (army), Singapore, South Korea (air force), Spain (army), Sudan (air force), Thailand, Indonesia (army/air force), Turkey (army), AC (air force), Venezuela



Manufacturer

Armstrong Helicopters (French EPAs Helicopters) and Singapore made a joint venture to supply technology. An Eurocopter has signed a deal for co-production

Eurocopter AS 332B2

Cougar

(Type 332B2)



Eurocopter AS 132A2 Cougar rescue version with in-flight refuelling probe

Turkey

Eurocopter BO 105 (Germany)

Type: Light helicopter

Accommodation: Two pilots, three passengers

Development/History

Bo 105 was first put into production in 1967 and is the world's first mass-produced rotorcraft with the German Army using the light aircraft as its main vehicle among other military uses such as medical evacuation. Delays in the first 10 years of production were caused by a soldier being killed in a crash landing and the rotor disc itself has been widely exported to civilian and military markets around the world.

Variants

BO 105C: initial version

BO 105CB: basic light observation/utility version

BO 105CBS: Standard utility version, with capacity for five passengers.

BO 105CBS: Standard utility version, with capacity for six passengers in Indonesia. BO 105C by Spanish Army.

BO 105LS: Canadian production version with registered Alouette 2 as a type designation.

BO 105L PZM: German naval version.

BO 105H Mk II: Basic version with enhanced maximum altitude to 10,000 ft (3,048 m).

BO 105H Mk II: Improved German and Spanish versions with three rotors.

BO 105H Mk II: Phase 2 10,000 ft German night attack version.

BO 105H Mk II: Improved German night attack version with 10,000 ft capacity.

BO 105H Mk II: Improved version with 10,000 ft capacity.

BO 105H Mk II: Spanish anti-aircraft version.



Eurocopter BO 105 CBS

(Eurocopter)

Specifications (for BO 105C)

Powerplant

Two Rotax 750-C700 turboshafts

Power: 140 hp (103 kW)

Max TBO: 40,000 h (10,000 cycles)

Payload: n/a

Dimensions

Length: 25 ft 1 in (7.64 m)

Rotor diameter: 28 ft 1 in (8.56 m)

Height: 7 ft 11 in (2.41 m)

Performance

Max speed: 140 mph (225 km/h)

Range: 500 mi (800 km)

Armament

100 and 105 are qualified for anti-aircraft, 105 can also carry a rocket.

105 can also carry a rocket.

HAL Advanced Light Helicopter (ALH) (India)

Type: Light multi-role helicopter

Accommodation: Two pilot, 12-14 passengers

Development/History

India's indigenous light helicopter programme was started by several defence departments in 1970s, leading to Hindustan Aeronautics Ltd. (HAL) winning the contract to develop and produce the light helicopter. The programme was a joint venture between HAL and the French helicopter manufacturer Eurocopter. The first flight of the HAL ALH was in 1998. A production rate of 20 per year is expected from 2002 onwards.

Variants

Army Air Force (ARF) version

Naval version (under development)

Light Attack Helicopter (Proposed gunship version)

Status

In production

Operators

HAL

Manufacturer

Hindustan Aeronautics Limited (HAL) (India)



HAL Advanced Light Helicopter

©HAL Information Group

Specifications

Powerplant

Two Euroturbo TM333-1A

Power: 4000 shp (1473 kW)

Dimensions

Length: 47 ft 4 in (14.45 m)

Rotor diameter: 43 ft 0 in (13.12 m)

Height: 16 ft 0 in (4.88 m)

Weights

Empty: 5510 lb (2500 kg)

Max TOW: 11 023 lb (5000 kg)

Payload: up to 1000 kg

Performance

Cruising speed: 152 mph (245 km/h)

Range: 400 mi (644 km)

Armament

The HAL ALH is a multi-role light helicopter. It is capable of carrying up to 12 passengers or 14 troops. It is also capable of carrying up to 1000 kg of payload. The HAL ALH is a multi-role light helicopter. It is capable of carrying up to 12 passengers or 14 troops. It is also capable of carrying up to 1000 kg of payload.

Eurocopter Tiger (Internationally)

Use – transport, troop, engineering support, medical, amphibious designations – 100, 150+ tons, amphibious variants, will not be if amphibious night, the Tiger – special amphibious variants

Status

in production

Operators

14

Manufacturer

Eurocopter (France/Germany)



Eurocopter Tiger
Eurocopter

EH Industries EH.101 Merlin (International)

Type: ST-60 heavy ASW helicopter, a jet engine for rotor

Accommodation: four pilots, observer, weapon crew

Development/History

The EH.101 helicopter development programme began in 1974, following a first stage requirement for both naval and army versions. Funding was agreed in 1984 to proceed with building three prototypes and subsequent development. The first prototype flew in the UK in 1987, and today there, the programme has led to the development of a helicopter with maritime, utility, airborne early war and troop passenger capability. The EH.101 is based on a modified Sikorsky HO4S design built by the British Royal Navy and 32 utility for the Royal Air Force in Norway and home replacement Navy's Navy has 'order of eight' the EH.101 that entered early testing and four utility versions.

Major orders were expected from Canada but the programme was shelved in 1993 after a change in government. Export orders have been broadly sought from Canada, Japan, the USA, Spain and the UK with the UK the major programme. In the Royal Navy is intended to use the EH.101 as a maritime patrol and the army version will be used as a utility helicopter. It is a joint venture of Boeing and Agusta, built in a joint venture of Boeing and Agusta. The EH.101 is a joint venture of Boeing and Agusta. The EH.101 is a joint venture of Boeing and Agusta.

Variants

EH.101 ASW: ASW version with anti-submarine warfare capability.
EH.101 ASW: ASW version with anti-submarine warfare capability.
EH.101 ASW: ASW version with anti-submarine warfare capability.
EH.101 ASW: ASW version with anti-submarine warfare capability.
EH.101 ASW: ASW version with anti-submarine warfare capability.



EH Industries EH.101 Merlin

©2010 AgustaWestland

Specifications (Basic Naval version)

Powerplant

Boeing T401 Turbine engine, 40% (1)
Boeing T401 Turbine engine, 40% (1)
Boeing T401 Turbine engine, 40% (1)
Boeing T401 Turbine engine, 40% (1)

Dimensions

Length: 24.4 m (80 ft 0 in)
Rotor diameter: 24.4 m (80 ft 0 in)
Height: 7.6 m (25 ft 0 in)

Weights

Empty: 47,000 lb (21,326 kg)
Max T/O: 70,000 lb (31,751 kg)
Payload: 10,000 lb (4,536 kg)

Performance

Max speed: 150 mph (241 km/h)
Range: 1,000 mi (1,609 km)

Armament

Mk 46, Mk 48, Mk 49, Mk 50, Mk 51, Mk 52, Mk 53, Mk 54, Mk 55, Mk 56, Mk 57, Mk 58, Mk 59, Mk 60, Mk 61, Mk 62, Mk 63, Mk 64, Mk 65, Mk 66, Mk 67, Mk 68, Mk 69, Mk 70, Mk 71, Mk 72, Mk 73, Mk 74, Mk 75, Mk 76, Mk 77, Mk 78, Mk 79, Mk 80, Mk 81, Mk 82, Mk 83, Mk 84, Mk 85, Mk 86, Mk 87, Mk 88, Mk 89, Mk 90, Mk 91, Mk 92, Mk 93, Mk 94, Mk 95, Mk 96, Mk 97, Mk 98, Mk 99, Mk 100, Mk 101, Mk 102, Mk 103, Mk 104, Mk 105, Mk 106, Mk 107, Mk 108, Mk 109, Mk 110, Mk 111, Mk 112, Mk 113, Mk 114, Mk 115, Mk 116, Mk 117, Mk 118, Mk 119, Mk 120, Mk 121, Mk 122, Mk 123, Mk 124, Mk 125, Mk 126, Mk 127, Mk 128, Mk 129, Mk 130, Mk 131, Mk 132, Mk 133, Mk 134, Mk 135, Mk 136, Mk 137, Mk 138, Mk 139, Mk 140, Mk 141, Mk 142, Mk 143, Mk 144, Mk 145, Mk 146, Mk 147, Mk 148, Mk 149, Mk 150, Mk 151, Mk 152, Mk 153, Mk 154, Mk 155, Mk 156, Mk 157, Mk 158, Mk 159, Mk 160, Mk 161, Mk 162, Mk 163, Mk 164, Mk 165, Mk 166, Mk 167, Mk 168, Mk 169, Mk 170, Mk 171, Mk 172, Mk 173, Mk 174, Mk 175, Mk 176, Mk 177, Mk 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On 148 Project: Proposed Canadian
and USMC variants

On 140 Project: Proposed Canadian
marine variant

Proposed: Proposed Canadian marine
variant

Status

in production

Operators

Italy, Israel, UK, Norwegian force

Manufacturer

Agusta (Italy) and Bristow
Helicopters (GKN Westland UK)

Left

EH Industries EH.101 Merlin
(GKN Westland)

Right

EH Industries EH.101 Merlin
(GKN Westland)



NATO Helicopter Industries NH 90 (International)

Type: Multi-role medium lift/troop-lift helicopter

Accommodation: Two pilots (NFH) three systems operators (IT) 20 troops

Development/History

The multi-national project began in 1988 and originally involved five nations. However, Belgium pulled out in 1988, leaving France, Germany, Italy and the Netherlands to continue equipping the NATO Future Helicopters (NFH) and National European Helicopter (NEH) full scale development began in 1992, and the first prototype flew in 1995. The armed prototype engaged with fly-by-wire flight control systems late in 1997.

Belgian cancellations in Western Europe have led to the programme being mainly driven and delivered by the United Kingdom. The funding for the production delivery programme was agreed. The Netherlands is taking 20 NFH, Germany began 3600, an early wave 200 without transports from 2000 and 10 NFH from 2007. France has ordered 27 NFHs from 2006 and 23 NFHs from 2007 and Italy requires 60 NFHs and 140 NFHs from 2006, in total, 640 helicopters are on order, but may eventually rise above 1000 due to the current future European defence budget cuts.

Variants

NH 90 NFH – export to Europe and adapted for both helicopter and utility roles.
NH 90 National European Helicopter

Status

Phase 1/2/3/4/5/6/7/8/9/10

Operators

France



NH Industries NH 90

Specifications (For NFH)

Powerplant

Two Rolls-Royce Eurospiral/Turbo-prop RTM 322
P170 or General Electric/Mitsubishi Motors F402
4773 turbo-shafts
Power: 1,600 hp (1,176 kW) x 2 =
4,000 hp (2,982 kW)

Dimensions

Length: 27.6 m (90 ft 8 in)
Rotor diameter: 33 ft 5 in (10.2 m)
Height: 10 m (32 ft 8 in)

Weights

Empty: 4,740 lb (2,148 kg)
Max 150: 20,000 lb (9,070 kg)
Payload: 6,400 lb (2,900 kg)

Performance

Max speed: 160 mph (260 km/h)
cruise range: 650 nmi (1,200 km)

Armament

Anti-submarine helicopters, and ship-attacks.
depth charges, 7.62 mm or 12.7 mm close range

Manufacturer

EH with Leonardo
Finmeccanica Agusta (Italy)
and Fokker (Netherlands)



Flight:
NH Industries NH90
Utility Pack/MR.

Agusta A 109 (Italy)

Type **light helicopter** (the A-109CM)

Accommodations: Two pilots, six passengers

Development/History

Agusta's light helicopter spun into being in 1970 and has sold well since its first flight in 1975. Agusta's history, which is less than that of some of its European rivals in 1980, although British is the only participation in the market — the Agusta 109 is a joint venture production of Agusta Italy and Bell Helicopters.

Variants

A-109: initial production version

A-109M: Civil version

A-109C: "Wildcat" version with improved transmission

A-109EQ: Basic Italian army version

A-109CM: current production military version with several weapon improvements

A-109M: Italian Army version with 108-4000 rpm geared anti-aircraft missiles

A-109: single-seat, unarmored, and ruggedized for desert operations

A-109C: heavy-duty version

A-109M: civil certification, push 550kW (738 hp)

Rotors: 1st Axis: 10.1 m (33 ft) 2nd Axis: 10.1 m (33 ft) 3rd Axis: 10.1 m (33 ft)

A-109M: Navy version

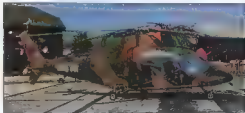
A-109M: Medical evacuation version

A-109M: Coast guard version

A-109 Power: Two-Phase II (Widened 2000) powerplant, each rotor 732 hp (540 kW)

Status

in production



Italian army Agusta A109

Agusta A109M

Specifications

Powerplant

Two Allison 250B1 turboprops
Power: 700 hp (510 kW)

Max TBO: 5000 h (3750 kg)

Payload: 1000 kg (2200 lb)

Dimensions

Length: 10.1 m (33 ft)

Rotor diameter: 10.1 m (33 ft)

Height: 10.1 m (33 ft)

Performance

Max speed: 100 mph (160 km/h)

Range: 400 nm (740 km)

Armament

108-4000 rpm geared anti-aircraft missiles, machine gun pod, 1000-kg rocket, 1000-kg rocket, 1000-kg rocket

Operators

Argentina, Australia, Belgium,
Brazil, Canada, Colombia, Costa
Rica, Czech Republic, Denmark,
France, Germany, Greece, India,
Israel, Italy, Japan, Korea, Kuwait,
Lebanon, Malaysia, Mexico,
Morocco, Netherlands, Norway,
Pakistan, Peru, Philippines, Poland,
Portugal, Romania, Saudi Arabia,
Singapore, Slovakia, Slovenia,
Spain, Sweden, Switzerland, Taiwan,
Thailand, Turkey, United Kingdom,
United States, Uruguay, Venezuela

Manufacturer

Agusta S.p.A.



Right

Agusta A109 Mangusta
Ten Ripley

Variants

A 28 Blade - about 6 cm (2.4 in) wider

A 28 Snar - Proposed for use by ground forces with dual mounted anti-air and anti-armor guns

A 28 International - Intended to replace the AH-64 Apache, for the Italian Army, with improved weapons systems

A 28 Salsbater - Proposed heavyfield version

A 12s MultiRole - Proposed for use as an external gunship, armed in capability to take on both air and ground targets, with a range of 20 miles (32 km) (32 km)

Status

In production

Operators

Italy (main)

Maps, facts, etc

Agusta (2014)

Flight

Agusta A129 Mangusta

(7th display)



Agusta-Bell AB 212 (Italy)

Type: **4** - rotor, multi-mission helicopter

Accommodation: **two** pilots, **seventeen** passengers, **eight** crew members or **several** passengers

Development/History

This page also contains a timeline version of this page at [412](#) aircraft.com for the Agusta-Bell AB 212 helicopter for many NATO nations. They are easily identified by the large rotor blades shown on cockpit and under the forward hull. A variety of service searchlight nations have been installed, including: **USA**, **UK**, **Canada**, **FR**, **Italy**, **Spain**, **Germany**, **Sweden**, **NL**, **AE**, etc. **Spain** ordered 1,000 units, which led to an extensive work to upgrade design and build both either a mix of anti-submarine helicopters or anti-ship. **Sweden** made the Spanish version the active during the 1990-00 but the other Italian, Greek, Spanish and British versions were used to its own. As mentioned, against the former Yugoslav.

Variants

AB 212 ASW Anti-submarine

AB 212 SHW Anti-ship warfare vehicle

HA 212 Spanish amphibious

Status

in production

Operators

Naval Italy, **Spain**, **UK**, **Italy**, **Germany**, **France**, **Spain**, **Sweden**, **UK**, **Canada**, **Germany**, **Spain**

Manufacturer

Agusta-Bell



From Agusta

Agusta-Bell AB 212ASW

Specifications (for AB 212 ASW)

Powerplant

one Pratt & Whitney PW4060 turbo-propeller
Power: 3,075 hp (2,270 kW)

Max L/D: 10:1 (10:1) (10:1)

Payload: 1,000 to 1,200 kg

Dimensions

Length: 42 ft 10 in (13.08 m)

Rotor diameter: 52 ft 7 in (16.01 m)

Height: 14 ft 10 in (4.52 m)

Performance

Max speed: 132 mph (194 km/h)

Range: 1,000 to 1,200 km

Armament

2x 12.7 mm (0.5 in) machine guns (optional)
1x 12.7 mm (0.5 in) machine gun (optional)
1x 12.7 mm (0.5 in) machine gun (optional)
1x 12.7 mm (0.5 in) machine gun (optional)

Kawasaki OH-1 (Japan)

Type: Utility attack and observation helicopter

Accommodation: Pilot, gunner/observer

Development/History

The first military helicopter developed entirely in Japan is considered to be the OH-1 in Japanese Ground Self-Defense Force service. It was developed at the Kawasaki Aircraft Development Center in 1970, and the first prototype flew for the first time in 1974, and the first prototype flew for the first time. Similar to appearance to the Apache A-120, the OH-1A features a four-blade main rotor and 15th generation materials, known as a design which the 1st defense budget included funding for the first three production aircraft.

Variants

OH-1

Status

In pre-production

Operators

Japan

Manufacturer

Kawasaki and Fuji Heavy Industries (Japan)



Kawasaki OH-1

Specifications

Powerplant

Two turbo SH-10 turboshaft

Power: 1210 shaft (1210/1100)

Max lift: 22,000 lb (10,000 kg)

Payload: n/a

Dimensions

Length: 29 ft 4 in (8.9 m)

Rotor diameter: 32 ft 9 in (10.0 m)

Height: 12 ft 5 in (3.8 m)

Performance

Climbing speed: 1,000 ft/min (305 m/min)

Range: 240 mi (386 km)

Weights

Empty: n/a

Armament

Includes Type 89 air-to-air missiles, anti-tank guided missiles, 70 mm light mortars, 120 mm and 160 mm mortar launchers.



Kamov Ka-25 (Russia) NATO reporting name 'Hormone'

Type **Small amphibious helicopter**

Accommodation **Two pilots (up to 4) 12 passengers**

Development/History

First KA-25s were built in service of the Soviet Navy. KA-25s are KA-26s with the KA-25 rotor hub. KA-26s have a KA-25 rotor hub and KA-26 specifications in construction.

Variants

Ka-25B, Naval version

Ka-25B, High speed and rising attack helicopter

Ka-25B, Helicopter-A, High speed and rising attack helicopter with KA-25 sensor, dipping sonar and sonobuoy launcher

Ka-25B, Helicopter-B, Specialized version with a high speed and rising attack mission and cruise guidance for submarine and ship-mounted cruise missiles. For cable-controlled and nuclear-capable

Ka-25B, T-10, Cruise tracking version

Ka-25B, Helicopter-C, Specialized version with a high speed and rising attack mission and cruise guidance for submarine and ship-mounted cruise missiles

Ka-25B, Helicopter-D, High speed and rising attack version

Ka-25B, High speed and rising attack version

Status

Not in production

Operators

Russia, Armenia, Belarus, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Uzbekistan

Manufacturer

Kamov Aircraft Co. (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.) (Kamov Aircraft Co.)



Ka-25B 'Hormone-A' on the deck

Aviation

Specifications (for Ka-25Bsh)

Powerplant

Two Alouette III 1500 hp (1104 kW)

Power 1500 hp (1104 kW)

Weights

Empty 10 000 lb (454 kg)

Max MO 15 000 lb (726 kg)

Dimensions

Length 32 ft 6 in (9.9 m)

Rotor diameter 32 ft 6 in (9.9 m)

Height 17 ft 7 in (5.4 m)

Performance

Max speed 100 mph (160 km/h)

Range 100 mph (160 km/h) (100 mph)

Armament

Two 100 mm (4 in) guns, 100 mm (4 in) guns

Kamov Ka-27/28/32 (Russia) NATO reporting name 'Helix'

Type: **Search and rescue, anti-submarine, helicopter**

Accommodates: **Two pilots, systems operator**

Development/History

The Ka-27 inherited a longer heritage than the Ka-26. The first prototype flew in 1974, and entered service with the Soviet Navy in the early 1980s, its robust design and rugged construction having proven popular with crews.

Variants

Ka-27PL 'Helix-A': Basic version for Soviet Navy, also known as Ka-2701.

Ka-27PS 'Helix-B': Naval search and rescue version.

Ka-27PW: Amphib version of PS.

Ka-30 'Helix-A': Export version of PL.

Ka-30S 'Helix-C': Civilian utility and rescue version, with upgraded engines and search radar.

Ka-30H 'Helix-C': Civilian utility version.

Ka-32B: Twin flying crane.

Ka-120: Civil utility version.

Ka-31A: Anti-submarine version.

Ka-126: Civil version.

Status

In production.

Operators

India (two); Bangladesh (one); China (two); Cuba (one);

Manufacturer

Kamov Ltd, Anzhero-Siberian Kraevoye Obshchestvo, Novosibirsk, Russia (the Kamov Group, Novosibirsk).



Kamov Ka-32 'Helix'

see page 52

Specifications (Ka-28)

Powerplant

Two Kamov TV3-117V turboprops.

Power: 4,400 hp (3,240 kW).

Dimensions

Length: 27 ft 6 in (8.4 m).

Rotor diameter: 37 ft 11 in (11.6 m).

Height: 14 ft 6 in (4.4 m).

Weights

Empty: 4,700 lb (2,132 kg).

Max MTOW: 24,250 lb (11,000 kg).

Payload: 11,000 lb (5,000 kg).

Performance

Max speed: 148 kph (92 mph).

Range: 432 mi (700 km).

Armament

Anti-submarine rocket probes, depth charges.

Kamov Ka-29 (Russia) NATO reporting name 'Helix-B'

Type: *Assault helicopter* Accommodations: *Two pilots, 16 troops*

Development/History

Capitulating on the success of the Ka-27 family, Kamov initiated the specialized assault helicopter version in the late 1980s. It was designed to operate off the Soviet Navy's amphibious landing ships, and is considered to be the 'major' Mi-24 - containing weapons and a limited carrying capability.

Variants

Ka-29 B: Mi-24 B's assault transport version, also known as Ka-25TB.

Ka-29H B: Adapted to be a day and/or night version series, redesignated Ka-31.

Ka-29K: prototype and intermediate version based on Ka-29 B frame.

Status

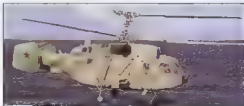
in production

Operators

Russia: many

Manufacturer

Kamov: Aviaexport (Borisovskaya) also for Eastern Bloc
Dassault designs.



Kamov Ka-29

(Rozyslawski)

Specifications

Powerplant

Two Dvornik Iv12-2a turboshaft

Power: 4000shp (2x2000shp)

Dimensions

Length: 32 ft 1 in (9.81 m)

Rotor diameter: 32 ft 2 in (9.8 m)

Height: 17 ft 8 in (5.4 m)

Weights

Empty: 12 170 lb (5520 kg)

Max WO: 27 775 lb (12 600 kg)

Payload: 16 0 lb (4000 kg)

Performance

Max speed: 174 mph (280 kmh)

Range: 240 mi (400 km)

Armament

Two 730 mm trailing type machine guns in doors, four hard points (M) 34 30mm PL 5
Specifications can vary up to mid-1990s.
includes one 30mm machine, 2x 12.7 mm
gun pods

Kamov Ka-50/52 Werewolf/Alligator (Russian NATO reporting name: "Wolcov")



First flight: 1989; experimental delivery vehicles in the naval forces; price in flight: the pilot safely away from the helicopter

Variants

with an all-terrain

Ka-50 Werewolf/Black Shark/Hellfire Subter

[also: Israeli Helium A1/P-551st] (also: single-seat version)

Ka-52 Alligator (unofficially Helium- 37/P-551st) (also: two-seat version)

Status

in limited production

Operators

Russian (Army)

Manufacturer

Design & Development: Kamov Co (Russia) in Kamov OJSC (Russia) design

Kamov Ka-50/52 Werewolf

(Tim Roper)

Mil Mi-2 (Russia/Poland) NATO reporting name 'Hoplite'

Type Light helicopter Accommodation One or two pilots, eight passengers

Development/History

Under Warsaw Pact resuscitated defence plans, the PZL Świdnik plant was nominated as the sole production site for the Mi-2. Mi-2 design, the first Polish-built Mi-2, flew in 1985, and more than 4,000 were built up until production ceased in 1990. The light of day took its toll on exports, with only 200 'Amber' and 'Baltic Port' general forces, including anti-air operations in Afghanistan and other conflicts, and civil versions have been, some produced in the USA.

Variants

Mi-2 Unarmed utility/transport version

Mi-2M Dual control trainer

Mi-2M Technical and flight power

Mi-2S Medical evacuation version

Mi-2MS Helio-Armed version with 23 mm cannon pod and rocket machine guns

Mi-2 BMS Salmowianka, Armed reconnaissance version with 23 mm cannon and two high rocket pods

Mi-2s HP Aspykanta, Anti-tank version with Malyutka guided missiles

Mi-2000M, up-gunned version with Mi-23 Strela 2

Mi-2C Charka, Theoretical test state-of-the-art and upgrade

Mi-2B up-gunned version with up-gunned rotor blades for use by the 1st Military Unit

Mi-2BM, guard rescue version

Mi-2MS Reconnaissance version

Mi-2RS, Chemical reconnaissance version

Mi-2SR Dual role test trainer



Mil Mi-2 'Hoplite'

© Tim Rappley

Specifications (for Mi-2T)

Powerplant

Engine(s) 1 x 1750 hp (1280 kW)

Power 800 shp (588 kW)

Dimensions

Length 32 ft 4 in (9.84 m)

Rotor diameter 47 ft 6 in (14.5 m)

Height 12 ft 3 in (3.7 m)

Weights

Empty 5255 lb (2383 kg)

Max 10700 lb (4853 kg)

Payload 4700 lb (2133 kg)

Performance

Max speed 124 mph (200 km/h)

Range 221 nm (410 km)

Armament

One light machine gun and rocket pods, 241MM Malyutka (AT-3 Sagger) anti-guided missile, 80MM Strela 2 (SA-7 Grail) air-to-air missile.



Mil Mi-6 (Russia) NATO reporting name 'Hook'

Type Heavy lift helicopter Accommodation Two pilots, flight engineer, navigator, radio operator, 6-75 troops, 41 stowage

Development/History

Mil's first heavy lift helicopter made its first flight in 1952 and quickly set new standards in carrying capacity. The large transporter of its generation, the Mi-6, was developed very quickly. Service in Europe and Afghanistan.

Variants

- Mi-6 Troika A Basic version
- Mi-6P Civilian passenger version
- Mi-6 Military utility version
- Mi-6MP/KPa Hook B Commercial version
- Mi-6M/KPa Hook C Commercial type also called Mi-22
- M-6PS Military rescue version
- Mi-6SD/KPa Fire fighting version
- Mi-6S Medical evacuation version
- Mi-6Pa Maritime version
- Mi-6B Fuel transporter

Stats

Max weight 12,000 kg

Operators

Air Force, special units, foreign military, domestic forces, Police, job farms, rescue services, Syria, Lebanon, Vietnam

Manufacturer

Helicopters (Russia) Mil Helicopters (Russia) P. Milov A. Mil Ltd (Russia) group



Mil Mi-6 Hook

www.flyingscots.com

Specifications (for Mi-6T)

Powerplant

Two five-blade propellers with fixed pitch constant speed
Power 14,000 hp (10,300 kW)

Dimensions

Length 33.8 m (110 ft 10 in)
Rotor diameter 17.4 m (57 ft 1 in)
Height 12.1 m (39 ft 8 in)

Weights

Empty 10,000 lb (4,535 kg)
Max (G) 34,000 lb (15,400 kg)
Fuelled 20,450 lb (9,275 kg)

Performance

Max speed 110 mph (180 km/h)
Range 500 nm (925 km)

of being used as a main-lift helicopter (Mi-8MT) for the full version.

Mi-8PS: Passenger and VIP transport version, also known as Mi-8-1000 or P.

Mi-8TPS: Airborne transport command version.

Mi-8M: 800-ton military design version for an armed version with Ty-1000. Apparently, Ty-1000 does

equipped changes. After the build version known as Mi-8MT/PS-1. Mi-8 MT/PS-2, -3 are conversions to Mi-17, variants with gun variants.

Mi-8MTV: TV's Mi-8M1A (armed version, both passenger version).

Mi-8TV: Hip-E: Armed version with 12.7 mm machine gun in nose and proton-armed missile.

Mi-8TR: Hip-P: Armed rapid version with six launchers for Strelas (armed).

Mi-8TL: P: accident investigation version.

Mi-8MS: For an aircraft/artillery spotting version.

Mi-8MPS: Search and rescue version.

Mi-8PC: P: VPS: Airborne radio command post version.

Mi-8PS: dis-0: Airborne command post version.

Mi-8PS: 7000: high-altitude version.

Mi-8MTV/PS: 'Hip-D': Airborne command post and communications version.

Mi-8MTV 'Hip-F': Communications (command) version.

Mi-8PPA: 'Hip-G': special electronic warfare version.

Mi-8PD: Police airborne command post version.

Mi-8MA: Artillery observation version.

Mi-8M: Mi-8 are ambulance versions, also serves as Mi-8M variant.



Mil Mi-8TV 'Hip-E' of the Ukrainian Army Aviation on UN duty in Croatia (Tom Ripley)



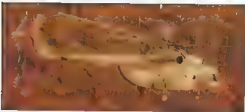
Mil Mi-8M 'Hip-H' of Iraqi Air Force

10/10/17



Mil MI-17M 'Hip-H'

(Time Report)



Mil

Mil-8HD Improved helicopter with increased lift capacity, built by Russian forces. The **8HD** has longer rotor blades and a more powerful engine and rotor gearbox assembly.

Mil-17 'Hip-H' Export designation for up-graded Mi-8MT/MH version with TV-17M engine and Mi-17MT/MH 'Hip-HMT' export model provides version with more powerful engine and more powerful rotor gearbox assembly designed for improved performance against enemy forces.

Mil-17B-2 Czech electronic warfare version. Mi-17B-2 incorporates with TV-17M engines, new clamshell rear cargo doors and loading ramp.

Mil-17B Russian version with new engine.

Mil-17 **HC** High altitude operations version with TV-17M engines.

Mil-30 Proposed Czech-built Mi-8 export.

Mil-17B Military transport and gunship version with TV-17M engine.

Mil-17B **EW** Electronic warfare version.

Mil-17Z **EW** **17M** Export version to Mi-8MTC standard.

Mil-17M Export passenger version.

Mil-18 Armoured transport helicopter to be put into service version.

Mil-19 version to Mi-17 rotor for increased payload.

Mil MI-8T 'Hip-C' of Croat Air Force seen over Bosnia
(Time Report)

Mil Mi-14 (Russia) NATO reporting name 'Haze'

Type: Land-based ASW helicopter

Accommodation: Two pilots, sensor helicopter, MAD operator

Development/History

The Mi-14 is an amphibious version of the Mi-8 developed for the Soviet Navy as a three-bus ASW and rescue helicopter. The first prototypes flew in 1973, and it has since been exported to a number of pro-Soviet states.

Variants

Mi-8 helicopter

Mi-4PL 'Haze-A' ASW version with dipnet sensor, search radar, and radio- and radar-guided torpedoes deployed. Its TVS-17 engine rated to 1417 kW (1900-hp) was adopted during the early stages of production.

Mi-4PSC: Later version with better engines and sensors.

Mi-4BT 'Haze-B': Mine-escaper version produced.

Mi-4PS 'Haze-C': Search and rescue version, with more search light and air conditioner for rescues.

Mi-4PS 'Haze-K': Polish mine-escaper version.

Mi-4 (European): Mi-8 converted to for Britain.

Status

As of 1991 in production.

Operators

Belarus, Bulgaria, Cuba, Georgia, Iran, Iraq, North Korea, Papua New Guinea, Romania, Russia, Russia Navy, Russia Navy, Syria, Syria, Yugoslavia, Yugoslavia Navy.

Manufacturer

Designed by Milov. Manufactured by the TBK Bureau.



Mil Mi-14PS 'Haze-C'

(Potem MAD)

Specifications (for Mi-14PL)

Powerplant

Two turboshaft T6-111M turbofan x2

Power: 2400-shp (1750 kW)

Max 300-10,000 ft (10,000 ft)

Max 100-100

Dimensions

Length: 11.1 m (36 ft 4 in)

Rotar diameter: 11.1 m (36 ft 4 in)

Height: 2.1 m (6 ft 9 in)

Performance

Max speed: 140 km/h (87 mph)

Range: 100-1000 km

Armament

Two 12.7 mm machine guns, 12.7 mm machine gun, 12.7 mm machine gun, 12.7 mm machine gun.

Weights

Empty: 25,000 lb (11,340 kg)



Ms 244B This 250-page ledger for women will prove
interesting for the various studies of women's groups and
domestic studies.

Mr. Prior "lived off" his position by having candles made, 12 P
was making and Engraving medals

Table 2. Estimated heritability of BL and SL

Fig. 3. ^{238}U and ^{235}U contents of 50 g soil mixed with fuel

part. 343.07. 343.343 with code 371 from categories in some cases

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Fig. 2.4.2 Heat Q_{1-2} supplied from surroundings to system

RM-2 VMS Night (static, system up to go out + cleanup and off)
(duration: 10:15 hours)

MS-3400 supports eight output modes with window, auto, hold, and new MS-28 style in square wave form.

Abstract—The purpose of this study was to determine the effect of a 12-week training program on the heart rate (HR) and heart rate reserve (HRR) of sedentary middle-aged men. The subjects were randomly assigned to a control group (CON) and an exercise group (EX). The EX group performed a 12-week training program consisting of three sessions per week. The HR and HRR were measured at rest and during submaximal and maximal exercise at baseline and after 12 weeks. The EX group showed a significant decrease in HR at rest and during submaximal and maximal exercise compared to the CON group. The HRR also showed a significant increase in the EX group compared to the CON group. The results of this study suggest that a 12-week training program can improve the cardiovascular fitness of sedentary middle-aged men.

18-2475. *Polysiphonia conferta* (Turn.) Dawson

Table 2 *Continued*

Paperback

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26





Status

in service

Operators

Algeria, Argentina, Azerbaijan, Belarus, Bolivia, Bulgaria, Cambodia, China, Colombia, Cuba, Czech Republic, Denmark, Ecuador, Egypt, Ethiopia, Georgia, Germany, Greece, Guatemala, Hungary, India, Indonesia, Iran, Iraq, Israel, Italy, Kazakhstan, Kuwait, Laos, Lebanon, Libya, Madagascar, Malaysia, Mexico, Myanmar, Nepal, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Serbia, Slovakia, South Africa, South Korea, Spain, Sri Lanka, Sudan, Syria, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uzbekistan, Venezuela, Vietnam, Yugoslavia

Manufacturer

Boreskov, Kamov, Mil, Mil Moscow Helicopter Plant (Russia) or Mil (USSR, Russian design)

Left: **MI MI-24W 'Hind-E'** of the Polish Air Force

(Tim Roppy)

Right: **MI MI-26**

(Tim Roppy)



Mil Mi-26 (Russia) NATO reporting name 'Halo'

Type Heavy lift helicopter

Accommodation Two pilots, flight engineer/navigator 80 troops 60 stretchers

Development/History

Designed to replace the Mi-8, the Mi-26 is the most powerful helicopter in the world. It has a main-rotor speed equivalent to that of the C-130 transport aircraft and flies in 1971 the Mi-26 entered Soviet Army service and in 1985, the aircraft has chartered a number to support troops with a battle to take the island of Pagan in the Philippines.

Variants

Mi-26 Basic version

Mi-26T Civil version with G-36 engines

Mi-26M5 Heavy transport version

Mi-26M6 Heavy transport version

Mi-26T2 Civil

Mi-26M6 Improved version with G-36 engines

Mi-26M7 Proposed 30-seat passenger version

Mi-26T5 Civil version

Mi-26A Improved transport version

Mi-26TC 30-seat version with G-36 engines

Status

In production

Operators

India, China, Peru, Serbia (Army, Air Force, Navy), United States

Manufacturer

Evgeny Mil/Mil Moscow • 1st MAI Helicopter design



Mil Mi-26 'Halo'

in flight

Specifications (for Mi-26)

Powerplant

Two TV3-60 Progress G-115 non-turbine

no turboshafts

Power 2x 12,120 hp (15,000 kW)

Dimensions

Length 180' 2" (54.97 m)

Rotor diameter 305 ft 11.25 in

Weight 75,110 lb (34,100 kg)

Weights

Empty 21,500 lb (9,750 kg)

Max 1/G 123,400 lb (55,970 kg)

Payload 80,000 lb (36,300 kg)

Performance

Max speed 181 mph (79 km/h)

Range 424 mi (682 km)

Mil Mi-28 (Russia) NATO reporting name 'Havoc'

Type Attack helicopter Accommodation Pilot (in air) and gunner (hoist)

Development/History

Superficially similar in appearance to the American Apache for Mi-28 made its first flight in 1982. Since its introduction to the Soviet Army Aviation fleet helicopter combat in the 1980s, the Mi-28 has had a troubled history. The Russian Army Aviation has reportedly been producing its own up-to-date information on its Russian military aircraft, but no permitted foreign production taking place. The aircraft has been reported going through test stages, but despite its status as a close to the ground attack missions at very low altitudes, using armaments in display or armament systems include state-of-the-art night vision sensors and most modern night vision.

Variants

Mi-28 Basic version

Mi-28M Night attack version with improved sensors and most modern night vision

Status

1st line unit, combat use

Operations

Russia (Army)

Manufacturers

Belarus (Russia) to a Mil OKB design



Mil Mi-28M 'Havoc' with rotor-mounted sight

(Tim Riplay)

Specifications (for Mi-28)

Powerplant

Two Klimov TV3-117VM turboshafts

Power 4,000 shp (3,000 kW)

Dimensions

Length 55 ft 3 in (16.85 m)

Rotor diameter 56 ft 5 in (17.2 m)

Height 15 ft 9 in (4.82 m)

Weights

Empty 15,412 lb (7,000 kg)

Max T/O 25,062 lb (11,380 kg)

Maxload 14,000 lb (6,350 kg)

Performance

Max speed 188 mph (300 km/h)

Range 745 mi (1,200 km)

Armament

One 2A42 30 mm rotor-mounted cannon, 10M 12.7mm (50-cal) machine gun, 4A 2300 mm (91-in) missiles, 9M14 Shturm (AT-6 Spiral) anti-tank guided missiles, 9M133 Vokog (AT-4) 90 mm laser riding guided anti-tank missiles, two 12.7mm machine guns

Mil Mi-34 (Russia) NATO reporting name 'Hermit'

Type: **UH-19, heavy lift, transport**

Accommodation: Two pilots, two passengers

Development/History

Designed at a light, medium, heavy and heavy-lift helicopter for both the military and civil markets and is what the Mi-34 single its rugged features. It is also the first Soviet helicopter to be capable of executing a hoist or hoist. Production began in 1983, for a number of years, several deliveries of the first series of the Mi-34 production entered after a complete modernization.

Variants

Mi-34 (Basic version)

Mi-34 or VAZ- (Heavy-lift version, fitted with VAZ-430 or VAZ engines, each rated to 160 kW (217 hp))

Status

In production

Operators

Russia (air force)

Manufacturer

Progress Aerospace Aviation Co (Russia) and VAZ Motor Co (Almaz - Belarus) - Mi-34 (Russia) design.



Mil Mi-34

Mil VAZ-430

Specifications (for Mi-34)

Powerplant

VAZ (Motoren) 41-14V 26 air-cooled radial engine
Power: 220 hp (161 kW)

Dimensions

Length: 28 ft 7 in (8.71 m)
Rotor diameter: 37 ft 9 in (11.5 m)
Height: 10 ft 1 in (3.07 m)

Weights

Empty: 4,000
Max LTO: 21,750 lb (9,865 kg)

Performance

Cruising speed: 172 mph (160 km/h)
Range: 224 mi (360 km)

Mil Mi-38 (Russia)

Type: Medium Helicopter Accommodation: Two pilots, 32 passengers

Development/History

Even before the replacement for the Mi-8s in the medium transport roles, the Mi-38 programme for civil use was not beyond the prototype stage because of lack of serious development work back in the early 1990s, and a mission flight was reported for 1975, but did not occur. It looks very similar to the Mil Mi-26.

The helicopter has many unique features, including a six-bladed main rotor, a delta 3 rotor hub similar to the Mi-26's, CRT cockpit displays and extensive use of composite materials. Large rotors will be used to deliver payload positioned in the midline main-deck main doors and a loading crane. Eurocopter are working jointly with Mil (RUS) and Kazan Helicopters in the programme.

Variants

Nil

Status

In part of development

Operators

Nil

Manufacturer

Russian Helicopters Plant (Tatarstan) to Mil (RUS) (Moscow) design



Model of the proposed Mi-38

(Peter Jackson)

Specifications (for Mi-38)

Powerplant

Two Eurocopter TP4-1170 turboshafts
Power: 4600 hp (1450 kW)

Max lift: 27 000 lb (12 000 kg)
Payload: 15 000 lb (6800 kg)

Dimensions

Length: 94 ft 2.5 in (28.70 m)
Rotor diameter: 64 ft 6 in (21.00 m)
Height: 30 ft 10 in (9.43 m)

Performance

Cruise speed: 150 mph (240 km/h)
Range: 750 km (460 mi)

Armament

Nil

Weights

Empty: 15,000 lb

Mil Mi-40 (Russia)

Type: Attack Helicopter

Accommodation: Two pilots, 11 troops

Development/History

intended as an attack helicopter version of the Mi-35 attack helicopter. It shares many of the systems of the Mi-35, including engine, transmission, rotor and tail rotor.

Variants

1.

Status

In ser. production

Operators

RU

Manufacturer

Designed by: VVS OKB (Russia) design



Denel Aviation CSH-2 Rooivalk (South Africa)

Type: Attack / Close air support Accommodation: Pilot (seal), co-pilot/piloter (fixed)

Development/History

South Africa has been the world's first beneficiary of an attack helicopter programme. This is because since 1982 it signed a development agreement with Alouette Helicopters (now Boeing) from the Republic of France to develop the South African Air Force's new attack helicopter. Despite the fact that between 1981 and 1982 the order of 100 helicopters was already under the command may well be the first customer for the Rooivalk.

Variants

XB66: Experimental Development Model

CSH-2: Basic production model

ADAL: Advanced development model

Status

In pre-production

Operators (proposed)

Ministry of Defence, South Africa (air force)

Manufacturer

Alouette Aviation/Boeing Helicopters (South Africa)



Denel Aviation Rooivalk

Denel Aviation

Specifications (for CSH-2)

Powerplant

Two Turboprop Turboprops

Power: 4000 shp (2982 kW)

Weight: 3032 lb (1374 kg)

Performance

Max speed: 180 mph (300 km/h)

Range: 160 nm (300 km) / 120 nm (220 km)

Max altitude: 10,000 ft

Dimensions

Length: 54 ft 3 in (16.5 m)

Rotor diameter: 49 ft 5 in (15.06 m)

Height: 15 ft (4.6 m)

Armament

One 20-mm GA-1 Rocket launcher, 20 x 70mm

FT-20 x 27.6 mm (20 mm) laser-guided anti-tank

rocket, VOG, 70mm and 81mm anti-aircraft missiles

One 70mm rocket

Weights

Empty: 11,610 lb (5270 kg)

Max. TO: 20,773 lb (9460 kg)

Denel Aviation CSH-2 Rooivalk (South Africa)



Denel Aviation Rooivalk

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Westland Wasp (UK)

Type Light general-purpose helicopter

Accommodation One pilot, three passengers

Development/History

Over the primary shipborne small helicopters of the 1940s, the West Wasp is a little different and it is the product of better, albeit not a perfect, design by its last developing team.

Variants

Wasp HAS.1 (single-engine version)

Status

Not longer in service, 1980.

Operators

Indonesia (naval), Malaysia (naval), New Zealand (air force)

Manufacturer

Wessex Aircraft, and later, British Helicopters



Westland Scout AH.1A.1

Tim Ryan

Specifications

Powerplant

One 16-hp (1200) British Rover 501 turbofan

Power 110 shp (81.0 kW)

Max. Alt. 12,000 ft (3,658 m)

Payload 1,400 lb (635 kg)

Dimensions

Length 30 ft 4 in (9.2 m)

Rotor diameter 32 ft 6 in (9.9 m)

Height 11 ft 8 in (3.6 m)

Performance

Max speed 120 mph (193 km/h)

Range 210 mi (338 km)

Armament

MA 40 rockets, AA 2 wire-guided missiles

MA 44 rocket launchers

Weights

Empty 2,450 lb (1,106 kg)

Westland Lynx (Army version) (UK)

Type: light attack/assault/tactical helicopter

Accommodation: Pilot, observer/gunner, 10 troops

Development/History

The British Army's primary light helicopter is another product of the Anglo-French helicopter Agreement of 1962. Britain's Westland supplied the design of the Lynx, and it also remains responsible for its development, production and marketing. Since 1973, it has made the British Army with little landing gear, but export sales proved elusive. The British Army Air Corps and Royal Marine Wing have converted their fleets to armed helicopter BHEAHs by fitting 80-mm TOW anti-tank missiles. A further 20 AH 1 light and tactical helicopter versions were procured from 1988 to equip 24 Armoured Brigades.

Var units

AH – Original British Army utility version. Some examples arrived with 80-mm weapons.

AH 1 – AH 1 version armed version with AH 1 developed.

AH 1 – AH 1 version armed version.

AH 1 – AH 1 version armed version.

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AH 1 – AH 1 version armed version.



Westland Lynx AH.1

The Lynx

Specifications (for AH 1)

Powerplant

Two Rolls Royce Turbomeca

Power: 1000 hp (735 kW)

Max TOW: 10,000 lb (4,536 kg)

Payload: 1000 lb (453 kg)

Dimensions

Length: 40 ft 10 in (12.4 m)

Rotor diameter: 40 ft 10 in (12.4 m)

Height: 11 ft 6 in (3.5 m)

Performance

Cruising speed: 140 mph (225 km/h)

Range: 140 mi (225 km)

Armament

80-mm and improved 60-mm anti-aircraft guns.

missiles: 2.75 in x 20 mm dual air and

mounted machine guns, air-flight rockets

Weights

Empty: 6040 lb (2740 kg)

Westland Lynx (Army version) (UK)

Mk 80: Improved beach rescue version.
Mk 84: Improved fast jet rescue version.
Mk 86: Improved Mk 80 version equipped with APU – a power plant that allows compound helicopters with no gearbox able to land in.

Status

No longer in production.

Operators

11 operators.

Manufacturer

Westland Helicopters (UK).

Westland Lynx AH Mk 7

(The Ripper)



Westland Lynx (Navy version) (UK)

Type: Light, multi-purpose naval helicopter

Accommodation: Pilot, Observer/gunner, 10-14 seats

Development/History

Westland's development of the naval Lynx has proved far more success than its civil helicopter version. In 1971, the first of 17 bought by the British Royal Navy, were the first 200-hour trials with the aircraft, with the intention of being ordered.

Along with the Sea King intake, the Lynx proved a perfect fit for the Royal Navy's needs and the RAF's. With the RAF, the Royal Navy began major upgrade programmes to improve the rotor blades, power plant, sensor weapons systems and airframe side. The programme has continued through to the current HAS-8 variant, which is destined to be the last.

Variants

HAS 2(170) French Navy anti-submarine warfare version, with OHRA-Sigint (OH-170) radar and Albatron bombing system.

HAS 2 original British Navy Navy version with French Senneby radar, Bomba-dropping system and French development, M40.

HAS 3 improved British version with two Rolls-Royce Gem 4 - 1000-hp engines.

HAS 3C1 Specialised British version as a search and rescue version, HAS 3C2.

AS 35 Specialised British version with surveillance and secure communications equipment.

AS 35M Improved British version, the AS 35M with AS-350, which has a more advanced power plant and improved sensors.

AS 35T Improved British version with extended tactical



Westland Lynx HAS 2

©GKN Westland

Specifications (for HAS 2)

Powerplant

Two Rolls-Royce Gem 2 turboshafts,
Power: 1000-shp (734.2 kW)

Payload: 2000-lb (907 kg)

Performance

Cruising speed: 160 kts (296 km/h)
Range: 140 mi (230 km)

Armament

Mk 44, Mk 46 or Sting Ray anti-submarine
torpedoes, Mk 11 depth charges, Sea Skua radar-
guided anti-ship missile, AS-12 wire-guided
missile, 12.7 mm or 30 mm gun pods.

Dimensions

Length: 42 ft 9 in (13.0 m)
Rotor diameter: 42 ft 10 in (13.1 m)
Height: 11 ft 6 in (3.5 m)

Weights

Empty: 4000 lb (1790 kg)
Max. MTOW: 70 000 lb (31 750 kg)

Westland Lynx (Navy version) (UK)

options are: Navy and Army.

HAS 6 (RAF): deepwater rescue Navy version with two Sea King 400 engines and gearbox.

MR 21: Export version for Brazil, designated SAH 10.

MR 21A: Export version of Super Lynx to Brazil.

MR 23: Export version for Argentina, to be used to rescue and recover).

MR 25/26: 1A, Export a light version for Netherlands.

MR 27/28: 1A: Export version for Netherlands with one.

MR 30: Export version for Denmark.

MR 31/32: 400 Export version for Netherlands with MR3.

MR 35: Export version for Finland.

MR 37: Export version for Argentina.

MR 38: Export version for Germany.

MR 39: Export version for Nigeria.

MR 40: Export version for Denmark.

HAS 6: Super Lynx upgraded version, with up-rated Rolls-

Royce Sea King engines, SERP rotor blades, thermal imaging camera and improved fire-fight survival systems.



*Above:
Westland Lynx HAS
MR 30/Super Lynx
ICAN Norway.*



*Left:
Westland Lynx
HAS.MA 2 (FN)
Tiger Army.*

Mk 25 Export Super Lynx for Portugal
Mk 26 Export Super Lynx for South Korea
Si - 1450 export version for Sri Lankan with up- rated 440
Horse Power 42-1 engines and 740 ASB at
Super Lynx Series 2000/2000 Export versions with 1000+
CT5000 improved rotors and glass cockpit

Status

In production.

Operators

Bel, it (navy), Denmark (navy), France (navy) (army/navy),
Malawi (navy), Netherlands (navy), Nigeria (navy), Norway
(navy), Pakistan (navy), Portugal (navy), South Korea (navy),
UK (navy)

Manufacturer

Westland Helicopters/BAE Westland (UK)

Right

*Westland Lynx HAS Mk 26/Super Lynx
JRN Westland*



Kaman Seasprite (USA)

Operators

Argentina (gray), Australia
(gray), "Black" (gray), New
Zealand (all "black")

Manufacturer

Kaman Aerospace (US)



Flight:

Kaman SH-2F of HSL-34
(Jervis Bay/APC)

Bell Model 47 Sioux (USA)

Type: Light helicopter

Accommodation: Two pilots, one passenger

Development/History

Due to the low helicopter weight and easy-to-use design, after making its first flight in 1945, some 5,000 have since been built. Although it has been long withdrawn from frontline service by most NATO states, it can still be found in use in various corners of Asia and South America.

Var. units

H-3 Sioux: Base US Army and USAF version

H-3D/H-3D-1/H-3D-2: US Navy version variants

HH-37: US Navy version for training and ice-breaking ship operations

UH-33: Three-seat version

UH-37: US Navy ice-breaking variant

AH-47: Helicon-built version

AH 47D-2: K. built version, designated Sioux AH 177

Stats

No wings in profile view

Operators

Colombia (Army/AF), Germany (Army, Navy/air),

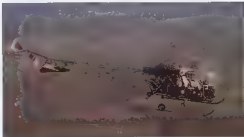
Israel, Italy (Army), New Zealand (Navy/Army)

Paraguay (Army/Army Navy), South Korea (Army), Algeria (Army), Canada

Manufacturer

Bell Aircraft Corporation (Bell Aircraft Company, USA)

Agusta (Italy), Westland Helicopters (UK) (Kawasaki Heavy Industries, Japan)



Bell 47G operated by the British Army as the AH 1 Sioux

A.7

Specifications (for Model 47G-3B-2A)

Powerplant

One Lycoming T55-L-15-F 18 piston engine

Power: 280 hp (205 kW)

Dimensions

Length: 31 ft 7 in (9.6 m)

Rotor diameter: 37 ft 6 in (11.3 m)

Height: 9 ft 3 in (2.8 m)

Weights

empty: 2000 lb (908 kg)

Max MTOW: 3100 lb (1408 kg)

Performance

Max speed: 105 mph (168 km/h)

Range: 515 mph (827 km)

Bell Model 204/UH-1 Iroquois (Huey) (USA)

Type  Helicopter

Accommodation: Two pilots, seven passengers

Development/History

The King of the Common Army family of helicopters which came to support of the US Army campaign in Vietnam. Several thousand built for the US armed forces from 1954 through to the late 1960s.

Variants

Huey A: Initial production version for US Army with Lycoming T53-L-11 turboprop, rated at 675 kW (925-shp). Capacity of six passengers. Source of Huey nickname.
Huey B: Enhanced version with capacity for seven passengers and seven more crew blades.

UH-1A: Re-designation in 1962 of Huey A.

UH-1B: Re-designation in 1962 of Huey B.

UH-1C: Improved version of UH-1A, with T53-L-11A powerplant.

UH-1E: US Marine Corps version with fuel tank that could run for more than 1 hr.

UH-1F: US Marine Corps Sea King variant.

UH-1H: 1400-hp turbine engine version with more with General Electric T53-GE-8, rated to 862 kW (1150-shp).

T-119: trainer version of A.

UH-1K: US Navy version with fuel tank and T53-L-11A powerplant, rated at 675 kW (925-shp).

UH-1L: US Navy utility version with T53-L-11A powerplant.

UH-1M: US Navy version with T53-L-11A powerplant.

UH-1N: US Army version with T53-L-11A powerplant.

AB 204: civilian land version, with a four-blade rotor, including the OH-1A, named as AB 204-1, 204-2, 204-3, 204-4, 204-5, 204-6, 204-7, 204-8, 204-9, 204-10, 204-11, 204-12, 204-13, 204-14, 204-15, 204-16, 204-17, 204-18, 204-19, 204-20, 204-21, 204-22, 204-23, 204-24, 204-25, 204-26, 204-27, 204-28, 204-29, 204-30, 204-31, 204-32, 204-33, 204-34, 204-35, 204-36, 204-37, 204-38, 204-39, 204-40, 204-41, 204-42, 204-43, 204-44, 204-45, 204-46, 204-47, 204-48, 204-49, 204-50, 204-51, 204-52, 204-53, 204-54, 204-55, 204-56, 204-57, 204-58, 204-59, 204-60, 204-61, 204-62, 204-63, 204-64, 204-65, 204-66, 204-67, 204-68, 204-69, 204-70, 204-71, 204-72, 204-73, 204-74, 204-75, 204-76, 204-77, 204-78, 204-79, 204-80, 204-81, 204-82, 204-83, 204-84, 204-85, 204-86, 204-87, 204-88, 204-89, 204-90, 204-91, 204-92, 204-93, 204-94, 204-95, 204-96, 204-97, 204-98, 204-99, 204-100, 204-101, 204-102, 204-103, 204-104, 204-105, 204-106, 204-107, 204-108, 204-109, 204-110, 204-111, 204-112, 204-113, 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Bell Model 204/UH-1 Iroquois (Huey) (USA)



1961-1970, 1971-1972

Map 20 series, designation of AS 204, AS 204A, later with modifications, 1961-1970, 1971-1972, 1973-1974, 1975-1976, 1977-1978, 1979-1980, 1981-1982, 1983-1984, 1985-1986, 1987-1988, 1989-1990, 1991-1992, 1993-1994, 1995-1996, 1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 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Bell Model 205/UH-1 Iroquois (Huey) (LSA)

Type **Medium** - 1 rotor

Accommodation Two pilot, 12 passengers, six stretchers

Development/History

The first major upgrade of the ever popular Huey, which had already entered service, this project took a common capability, the need to protect personnel from ground-based threats, and the need to protect the helicopter from the ground. The result was the UH-1H, which was first produced in 1968. It is still in production as of 2015, with only a few more to be built.

Variants

UH-1D Original US Army version, with General Electric T53-11 powerplant, rated at 820 kW (1,100 shp). Capable of carrying 12-14 passengers.

UH-1H Improved version, with General Electric T53-11 powerplant.

UH-1H US Army version and many variants with latest General Electric T53-11 powerplant.

UH-1H Canadian version, designated CH-119.

UH-1H British version, designated AH-1H.

UH-1H SAC version.

UH-1H Huey II - General Electric T53-11 powerplant.

Improved powerplant.

Huey III Commercial upgrade to carry 12-14 passengers.

UH-1H US Army Huey. Commercial upgrade to carry 12-14 passengers.

UH-1H Japanese version.

UH-1H Italian version, designated EH-1H.

UH-1H Improved Italian version.

UH-1H Prototype Italian version with two General



UH-1H Huey

Bell UH-1D of German Luftwaffe

Specifications (for UH-1H)

Powerplant

General Electric T53-11 turboshaft

Power: 1,100 hp (813 kW)

Max. RPM: 1,100 (1,100)

Payload: 12,000 lb (5,443 kg)

Dimensions

Length: 41 ft 3 in (12.5 m)

Rotor diameter: 48 ft 10 in (14.8 m)

Height: 14 ft 5 in (4.4 m)

Performance

Max speed: 170 mph (274 km/h)

Range: 270 mi (434 km)

Weights

Empty: 5,200 lb (2,358 kg)

Armament

Two machine guns in door, optional rocket and mortar gun pods.

Bell Model 205/UH-1 Iroquois (Huey) USA



1. *Journal of Management Studies*, 1997, 34, 1, 1-14.

Abb. 200/1A: Physiologischer Rhythmus der Herzschlagfrequenz

HE 06: Springing the trap. Open up. AM 30"

Addressing the 2008 *Journal of Management Inquiry* 25(1) 10-11

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[illegible]

Manufacturer

the first system, computerized the reports but not fully replaced them. With the second system, there are no full hard-

**Boat Lift IN of
US Army
Reserve
Jimmie**

Bell Model 212 UH-1N Iroquois (Twin Huey) (USA)

Type: Medium-lift helicopter

Accommodation: Two pilots, 14 passengers

Development/History

A twin-engine utility helicopter designed by Bell Helicopters, this is a military helicopter that Canadian forces ordered in 1961. The first helicopter delivery of the first series in 1962 and the construction of standard utility helicopters of the 47th Marine Corps Group was followed by large numbers, with more than 100 being sold to the

Variants

UH-1N: Basic US Navy and Marine Corps version

UH-1H: USAF and US Marine Corps VIP transport

CH-119: Canadian version, later designated CH-119 Twin Huey

Twin Huey Backer: civil transport version

AB 212: Italian-made utility version, with Pratt & Whitney Canada PT6T-1 motor, in a four-engine plan

AB 212ASW: Italian-made version, with four engines and a wide tail

UH-1B: Spanish Army designation

UH-1B (ABM): Spanish Army USMC upgraded version

Status

In production

Operators

Argentina, Australia, Austria, Bahrain, Bangladesh, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Germany, Greece, Guatemala, Honduras, India, Israel, Italy, Japan, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mexico, Morocco, New Zealand, Norway, Oman, Pakistan, Peru, Qatar, Saudi



Bell UH-1N of the USAF

USAF

Specifications (UH-1N)

Powerplant

Two Pratt & Whitney Canada PT6T-1B motor
each 180

Power: 1800 hp (1323 kW)

Dimensions

Length: 47 ft 4 in (14.44 m)

Rotor diameter: 40 ft 7 in (12.37 m)

Height: 14 ft 10 in (4.52 m)

Weights

Empty: 5747 lb (2584 kg)

Max lift: 11,400 lb (5150 kg)

Max gross weight: 12,500 lb

Performance

Max speed: 170 mph (273 km/h)

Range: 240 nm (444 km)

Bell Model 212 UH-1N Iroquois (Twin Huey) (1974-80)



1. *Вопросы к.п.н. и к.т.н. в области литературы и искусства*.
 2. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 3. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 4. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 5. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 6. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 7. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 8. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 9. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.
 10. *Вопросы к.п.н. и к.т.н. в области культуры и искусства*.

My next adventure

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**State LRP and the LRP
Office Manager**

Bell Model 412 (USA)

Type: Medium utility and transport helicopter

Accommodation: Two pilots, 14 passengers

Development/History

The most recent version of the 'Huey' 412 manages to hold customers around the world. A number of companies are also offering upgrade packages to their versions.

Variants

412: Basic production version

412SP: Special Performance version, with improved fuel capacity, known as Aspado in Norwegian service

412HP: Emergency medical service version, with an advanced communications suite (HUE) 100: 'Hard Hat'

MIL, Army 412: Armed version

412EP: Enhanced performance version with additional fuel. Designated QH-412 in US service

CH-412 QH-412: Canadian military version of 412SP

NH-412: Indonesian-built version

AM412: British Italian-built military version. Designated Hkp 4 in Italian service

AM 412 CH-412: Italian built ground surveillance radar platform

Hkp 1: Swedish designation

AM 412 EP: Aspado-built version

Status

in production.

Operators

Belgium, Germany, Canada, Colombia (air force), Guatemala, Guyana, Finland (coast guard), India (air), Indonesia (armed), Italy (armed), Japan (coast), Korea, Netherlands (air force)



Bell 412

Photo: Alamy

Specifications (for 412HP)

Powerplant

One Pratt & Whitney Canada PT6T-30A1 Turboshaft

Take-Off

Power: 1800 shp (1342 kW)

Dimensions

Length: 42 ft 4 in (12.82 m)

Rotor diameter: 46 ft (14.02 m)

Height: 15 ft 14.57 m)

Weights

Empty: 6054 lb (2745 kg)

Max T/O: 11 000 lb (5007 kg)

Performance

Cruising speed: 40 kts (74 km/h)

Range: 410 km (241 mi)

Armament

Just installed rocket guns, missile launchers, rocket pods, Air-to-air and air-to-surface missiles

Harvey P. (1910-1980), President
 1940-1942, and 1947-1949
 1949-1950, 1951-1952, 1953-1954
 1955-1956, 1957-1958, 1959-1960
 1961-1962, 1963-1964, 1965-1966
 1967-1968, 1969-1970, 1971-1972
 1973-1974, 1975-1976, 1977-1978
 1979-1980, 1981-1982, 1983-1984
 1985-1986, 1987-1988, 1989-1990
 1991-1992, 1993-1994, 1995-1996
 1997-1998, 1999-2000, 2001-2002
 2003-2004, 2005-2006, 2007-2008
 2009-2010, 2011-2012, 2013-2014
 2015-2016, 2017-2018, 2019-2020
 2021-2022, 2023-2024, 2025-2026
 2027-2028, 2029-2030, 2031-2032
 2033-2034, 2035-2036, 2037-2038
 2039-2040, 2041-2042, 2043-2044
 2045-2046, 2047-2048, 2049-2050
 2051-2052, 2053-2054, 2055-2056
 2057-2058, 2059-2060, 2061-2062
 2063-2064, 2065-2066, 2067-2068
 2069-2070, 2071-2072, 2073-2074
 2075-2076, 2077-2078, 2079-2080
 2081-2082, 2083-2084, 2085-2086
 2087-2088, 2089-2090, 2091-2092
 2093-2094, 2095-2096, 2097-2098
 2099-2100, 2101-2102, 2103-2104
 2105-2106, 2107-2108, 2109-2110
 2111-2112, 2113-2114, 2115-2116
 2117-2118, 2119-2120, 2121-2122
 2123-2124, 2125-2126, 2127-2128
 2129-2130, 2131-2132, 2133-2134
 2135-2136, 2137-2138, 2139-2140
 2141-2142, 2143-2144, 2145-2146
 2147-2148, 2149-2150, 2151-2152
 2153-2154, 2155-2156, 2157-2158
 2159-2160, 2161-2162, 2163-2164
 2165-2166, 2167-2168, 2169-2170
 2171-2172, 2173-2174, 2175-2176
 2177-2178, 2179-2180, 2181-2182
 2183-2184, 2185-2186, 2187-2188
 2189-2190, 2191-2192, 2193-2194
 2195-2196, 2197-2198, 2199-2200
 2201-2202, 2203-2204, 2205-2206
 2207-2208, 2209-2210, 2211-2212
 2213-2214, 2215-2216, 2217-2218
 2219-2220, 2221-2222, 2223-2224
 2225-2226, 2227-2228, 2229-2230
 2231-2232, 2233-2234, 2235-2236
 2237-2238, 2239-2240, 2241-2242
 2243-2244, 2245-2246, 2247-2248
 2249-2250, 2251-2252, 2253-2254
 2255-2256, 2257-2258, 2259-2260
 2261-2262, 2263-2264, 2265-2266
 2267-2268, 2269-2270, 2271-2272
 2273-2274, 2275-2276, 2277-2278
 2279-2280, 2281-2282, 2283-2284
 2285-2286, 2287-2288, 2289-2290
 2291-2292, 2293-2294, 2295-2296
 2297-2298, 2299-2300, 2301-2302
 2303-2304, 2305-2306, 2307-2308
 2309-2310, 2311-2312, 2313-2314
 2315-2316, 2317-2318, 2319-2320
 2321-2322, 2323-2324, 2325-2326
 2327-2328, 2329-2330, 2331-2332
 2333-2334, 2335-2336, 2337-2338
 2339-2340, 2341-2342, 2343-2344
 2345-2346, 2347-2348, 2349-2350
 2351-2352, 2353-2354, 2355-2356
 2357-2358, 2359-2360, 2361-2362
 2363-2364, 2365-2366, 2367-2368
 2369-2370, 2371-2372, 2373-2374
 2375-2376, 2377-2378, 2379-2380
 2381-2382, 2383-2384, 2385-2386
 2387-2388, 2389-2390, 2391-2392
 2393-2394, 2395-2396, 2397-2398
 2399-2400, 2401-2402, 2403-2404
 2405-2406, 2407-2408, 2409-2410
 2411-2412, 2413-2414, 2415-2416
 2417-2418, 2419-2420, 2421-2422
 2423-2424, 2425-2426, 2427-2428
 2429-2430, 2431-2432, 2433-2434
 2435-2436, 2437-2438, 2439-2440
 2441-2442, 2443-2444, 2445-2446
 2447-2448, 2449-2450, 2451-2452
 2453-2454, 2455-2456, 2457-2458
 2459-2460, 2461-2462, 2463-2464
 2465-2466, 2467-2468, 2469-2470
 2471-2472, 2473-2474, 2475-2476
 2477-2478, 2479-2480, 2481-2482
 2483-2484, 2485-2486, 2487-2488
 2489-2490, 2491-2492, 2493-2494
 2495-2496, 2497-2498, 2499-2500
 2501-2502, 2503-2504, 2505-2506
 2507-2508, 2509-2510, 2511-2512
 2513-2514, 2515-2516, 2517-2518
 2519-2520, 2521-2522, 2523-2524
 2525-2526, 2527-2528, 2529-2530
 2531-2532, 2533-2534, 2535-2536
 2537-2538, 2539-2540, 2541-2542
 2543-2544, 2545-2546, 2547-2548
 2549-2550, 2551-2552, 2553-2554
 2555-2556, 2557-2558, 2559-2560
 2561-2562, 2563-2564, 2565-2566
 2567-2568, 2569-2570, 2571-2572
 2573-2574, 2575-2576, 2577-2578
 2579-2580, 2581-2582, 2583-2584
 2585-2586, 2587-2588, 2589-2590
 2591-2592, 2593-2594, 2595-2596
 2597-2598, 2599-2600, 2601-2602
 2603-2604, 2605-2606, 2607-2608
 2609-2610, 2611-2612, 2613-2614
 2615-2616, 2617-2618, 2619-2620
 2621-2622, 262

Hardware

Dr. Wolfgang Wagner
L&A Canada, Agents Inc.
The following:



Bed 412 of Dubaut Police Air Wing Tim Rigney

Bell Model 206 JetRanger (USA)



Variant

TH-57B JetRanger US Army training version to 2008

variant

TH-57C JetRanger US Army training version to 2008

variant

AB 206A-1 Italian-produced military version to 2004

variant, designated **UH-31** Italian military

AB206A-2 Italian-produced military version to 2008

variant, designated **UH-31** Italian military

AB206C-1 Italian-made and built, upgraded to 200 standard with CTS engines

ABp 04 Swedish designation of Italian-produced 206A

U-128 Swedish designation of AB 206A-1

Zafor 300 Italian-produced version of 206B-1

Status

In production

Operators

Austria (Eurocopter AB), Brazil (Boeing), Canada (Bell), China

(American Eagle), Colombia (Air Force), Cyprus, Ecuador

(Fuerza Armada), France (Armée de l'Air), Guatemala

(Armada), India (Army), Iran (Army), Italy (Army), Laos

(Army), Malta (Military Air Force), Myanmar, Oman (Military)

(Army), Peru (Army), Philippines (Army), Portugal (Army)

(Army), Romania (Army), Saudi Arabia (Army), South Africa

(Army), Spain (Army), Thailand (Army), Turkey (Army)

(Army), USA (Army), Pakistan (Army), Bolivia (Army)

Venezuela (Army), Vietnam

Bell 206L-4 LongRanger 4

(Bell Helicopters)

Manufacturer

Bell Helicopter Company/Bell

Helicopters Textron (USACanada)

Agencia B. S. L. Chile (Army), Chile

Chile

Bell Model 206/OH-58 Kiowa (USA)

Type: ☐ All other willies and party indecencies

Accounting also fits in with the view that the firm is a collection of individuals, each with his or her own goals and objectives. The firm is seen as a collection of individuals, each with his or her own goals and objectives. The firm is seen as a collection of individuals, each with his or her own goals and objectives.

Development/History

As the storm begins to form, it's off to the left—the storm eye turns clockwise. As it moves on, it turns clockwise again. The lower atmosphere has more influence on a storm's direction than its high-level atmosphere.

vs. plants

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37-588, Project version of American Army

78-521 Ignored 15.4 sq acres with *Salpiglossis* groups.
new Illinois. 53-5220 subshrub, used as 313 628 (420
/sq)

COH-58A, calculator design of CO-58A standard, curve designated COH-58A.

Movie	MOGB	Rating	Australian produced version	Inter- national production
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
10	10	10	10	10
11	11	11	11	11
12	12	12	12	12
13	13	13	13	13
14	14	14	14	14
15	15	15	15	15
16	16	16	16	16
17	17	17	17	17
18	18	18	18	18
19	19	19	19	19
20	20	20	20	20
21	21	21	21	21
22	22	22	22	22
23	23	23	23	23
24	24	24	24	24
25	25	25	25	25
26	26	26	26	26
27	27	27	27	27
28	28	28	28	28
29	29	29	29	29
30	30	30	30	30
31	31	31	31	31
32	32	32	32	32
33	33	33	33	33
34	34	34	34	34
35	35	35	35	35
36	36	36	36	36
37	37	37	37	37
38	38	38	38	38
39	39	39	39	39
40	40	40	40	40
41	41	41	41	41
42	42	42	42	42
43	43	43	43	43
44	44	44	44	44
45	45	45	45	45
46	46	46	46	46
47	47	47	47	47
48	48	48	48	48
49	49	49	49	49
50	50	50	50	50
51	51	51	51	51
52	52	52	52	52
53	53	53	53	53
54	54	54	54	54
55	55	55	55	55
56	56	56	56	56
57	57	57	57	57
58	58	58	58	58
59	59	59	59	59
60	60	60	60	60
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62	62	62	62	62
63	63	63	63	63
64	64	64	64	64
65	65	65	65	65
66	66	66	66	66
67	67	67	67	67
68	68	68	68	68
69	69	69	69	69
70	70	70	70	70
71	71	71	71	71
72	72	72	72	72
73	73	73	73	73
74	74	74	74	74
75	75	75	75	75
76	76	76	76	76
77	77	77	77	77
78	78	78	78	78
79	79	79	79	79
80	80	80	80	80
81	81	81	81	81
82	82	82	82	82
83	83	83	83	83
84	84	84	84	84
85	85	85	85	85
86	86	86	86	86
87	87	87	87</	

Solve

1. *How many people are there in your family?*

Operations

^a Data are from the 1980-1981 survey; ^b data are from the 1976-1977 survey.

Revised: 10/1/2007

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Use Drug ID 354. Answer:

Figure 1

Specifications (for OH-58A)

How much is it?

Age Group	Male (%)	Female (%)
18-24	~15	~25
25-34	~20	~35
35-44	~35	~25
45-54	~45	~20
55-64	~30	~15
65-74	~15	~10
75-84	~10	~5
85+	~5	~5

Downloaded At: 11:53 11 September 2009

Discussion






























Downloaded At: 11:53 11 September 2009

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Workday 1

Age Group	Percentage (%)
18-24	45
25-34	55
35-44	60
45-54	65
55-64	70
65-74	75
75-84	80
85+	88

Julian 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 269

Performance

11. *Journal of the American Medical Association*, 2000; 283: 2689-2694.

Abstract: The purpose of this study was to determine the effect of a 12-week training program on the physical fitness of 100 male and 100 female students. The study was conducted in a school in Ankara, Turkey. The students were divided into two groups: a control group and an experimental group. The experimental group participated in a 12-week training program, while the control group did not. The physical fitness of the students was measured at the beginning and at the end of the 12-week period. The results showed that the experimental group had significantly higher levels of physical fitness than the control group at the end of the 12-week period. The training program was effective in improving the physical fitness of the students.

Bell Model 406/OH-58D Kiowa Warrior (USA)

Type: Light attack helicopter, reconnaissance, fire support

Accommodation: Two pilots with, by seat

Development/History

The lightweight version of the OH-68, the Kiowa Warrior began an extensive program and since 1980 has been in operation alongside the AH-64 Apache as part of joint air attack teams. The Army Helicopter Improvement Program (AHIP) began in 1981 and the first helicopters entered service in 1985.

Variants

OH-58D Kiowa Warrior: US Army armed scout version. Multi-Role variant began. Interservice US Army modification including folding rotor blades and tail to allow transport on C-130 transport aircraft.

Mini-Chance: Code-named for first aircraft fitted with Miller gun, Stinger missiles for stopping target duties in Afghan war in 1981.

OH-58D/C: Code-named for first aircraft fitted with Miller gun, Stinger missiles, and laser-guided bombs. Also has arm provision for GAU-20 machine gun but no need to sight.

OH-58D: Serial 1 technology demonstrator.

Status

In production

Operators

South Africa (army), Vietnam (army), USA (army)

Manufacturer

Bell Helicopter Textron (USA)



Bell OH-58D Kiowa Warrior

Bell Helicopter Textron

Specifications

Powerplant

One Allison T200-AJ-200 turboprop

Power: 754 hp (445 kW)

Max lift: 400 to 700 kg

Weighted: 2000 L (440 kg)

Dimensions

Length: 24 ft 4 in (7.4 m)

Rotor diameter: 25 ft (7.6 m)

Height: 12 ft 10 in (3.9 m)

Performance

Max speed: 47 mph (75 km/h)

Range: 250 mi (400 km)

Armament

Weapon: 30-cal machine, AGM-114 missile, laser-guided and -free missiles, machine gun pods, free-fight rocket pods

AH-1G. Its designation was upgraded to AH-1G in 1972. Model 100 has a main rotor cockpit glass, four 100-watt and 100-AC generator. Copter is armed with 100-watt. 100-AC generator. King Cobra. Each armed with 100-watt and 100-AC generator.

Status

Not in production

Operators

Bahrain, Israel, Japan (Army)
Jordan, Pakistan (Army), Saudi
Arabia (Army), Thailand (Army),
United States (Army)

Manufacturer

Bell Helicopter Corporation
10000 Bell Road, Bell, TX
75710-1000

Notes

**AH-1G Huey Cobra of
the Maryland National
Guard**

University Park, PA



Bell Model 209/AH-1W Super Cobra (USA)

Status

in production.

Operators

USA (mainline), Thailand
(army), army (army)

Manufacturer

Bell Helicopter Company/Bell
Helicopter Textron Inc., OH
SA Brazil, Romania,



Bell AH-1W Cobra
(Bell Helicopter Textron)

Bell/Boeing V-22 Osprey (USA)

Type: **Tiltrotor aircraft**

Accommodation: Two pilots (crew chief, J4 troops)

Development/History

Research began during the late 1970s as a prototype tiltrotor airplane has now progressed to production aircraft. The helicopter concept evolved in 1981. The Osprey got its wings in 1987 (first flight) and then flew solo to provide the power for horizontal flight. Current plans call for development for operations in the "Medium" category (a 40,000 lb aircraft) and a 200 lb "Low Wing" category. It is scheduled to become operational at MCAS Cherry Point, North Carolina by 2001. The V-22 requires the 50th Osprey for special operations missions to be in service by 2003. The US Navy wants 44 Ospreys for vertical search and rescue. The initial production began in 1999 at the aircraft's factory in 2000 with a decision on the production line in 2001.

Variants

V-22 LMD: Engineering and manufacturing development aircraft

MC-22B: US Marine Corps attack production version

SC-22A: Proposed attack LP Navy and submarine surface version

CV-22B: RAF special operations production version

W-22B: US Navy vertical search and rescue production version

HC-22B: US Navy search and rescue production version

Status

in production

400



Bell Boeing V-22 Osprey

Bell Boeing

Specifications (V-22B)

Powerplant

Two GE-T600-40B turboprops

Power: 12,300 hp (9,000 kW)

Dimensions

Length: 77 ft 4 in (23.6 m)

Wing diameter: 20 ft 10 in (6.35 m)

Height: 14 ft 6 in (4.4 m)

Weights

Empty: 21,000 lb (9,525 kg)

Max lift: 55,000 lb (24,945 kg)

Payload: 20,000 lb (9,072 kg)

Performance

Max speed: 150 mph (241 km/h) in cruise
mode: 150 mph (241 km/h) in cruise
Range: 1,000 mi (1,609 km)

Armament

Can be adapted to carry 10 troops and 1000
chairs

Operators

U.S. Marine Corps

Manufacturer

Bell Helicopter Industries

Boeing Helicopters (Boeing)



Bell Boeing V-22 Osprey
(Bell Boeing)

Boeing CH-47 Chinook (USA)

Topic: Involvement in the economy

Accommodation: Two plots, one of 55 tennis, 24 vetches

Development/History

The Wright C-130 Hercules is the world's most reliable aircraft and a heavy lift helicopter, named by the US Army as a "Yangtze" - it proved its worth in Vietnam, fighting in the jungle, snow and flying supplies and soldiers, across remote jungle for 4000 ft. long under enemy radar eyes and in the mountains - something no other "troop" or JS - type, Soviet or A - models were built for the purpose. For Vietnam War, and many under, were destroyed. A C-130 is a capable transport for the military, early enough the capability of the US Army's C-130s over the ensuing decades, just under 800 were in service with the US Army. JS Army C-130s are National Guard units.

[illegible]

It follows that the example of the City of New York is an



References

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Specifications (for CH-47D)

Prescription:

low values suggesting that FeO is abundant.

Discussion

Length 170.0 to 185.0 mm
Wing 65.0 to 75.0 mm
Tarsus 20.0 to 22.0 mm
Middle toe 18.0 to 20.0 mm
Weight 100.0 to 110.0 g

Age Group	A	B	C	D
18-24	~85%	~10%	~3%	~2%
25-34	~75%	~15%	~5%	~5%
35-44	~65%	~20%	~10%	~5%
45-54	~55%	~25%	~15%	~5%
55-64	~45%	~30%	~20%	~5%
65+	~35%	~35%	~25%	~5%

Murphy, J. B. 1983. *How to write a paper*.
 Malden, MA: PWS-Kent.
 Pechenik, J. 2003. *How to write a paper*.

Performance

Max speed: 132 mph (212 km/h)
Range: 662 miles (1065 km)

Abstract

Discussion

Boeing Chinook helicopter has been already built almost 7000, also it is at work steadily on a new upgraded version. The CH-47 is the most successful helicopter in the world, with 10000 service hours and 100000 flight hours, respectively. The CH-47 is the only helicopter in the world that can carry 10000 lbs of cargo. The CH-47 is also the only helicopter in the world that can carry 10000 lbs of cargo. The CH-47 is also the only helicopter in the world that can carry 10000 lbs of cargo.

Boeing Chinook has been used in many conflicts, including the Vietnam War, the Gulf War, the Kosovo War, the Afghanistan War, and the Iraq War. The CH-47 is also the only helicopter in the world that can carry 10000 lbs of cargo.

Variants

- CH-47A Original US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47B Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47C Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47D Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47E Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47F Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47G Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47H Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47I Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47J Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47K Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47L Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47M Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47N Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47O Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47P Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47Q Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47R Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47S Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47T Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47U Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47V Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47W Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47X Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47Y Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.
- CH-47Z Improved US Army version with F404-100 engine, 10000 lbs of cargo, 10000 lbs of cargo.



Boeing CH-47D

The Boeing

Boeing CH-47 Chinook USA

Chinook HC-1 British version is MH-47A - limited
MH-47A-Special Operations aircraft, latest upgrade for
US Army special operations, designated as MH-47G
MH-47E Special operations version with a 4th flight section,
night flying capability and 10mm missiles - carries, accommodates
a 1000-1000-1000
Model 4-40 Export model for CH-47C standard
International Chinook, Export model for CH-47D standard,
CH-47C Plus - all-terrain version with 750 - 1000
powerplants and composite blades.
CH-47C - all-terrain version for CH-47D standard
Boeing CH-47C Civilian version
HC CH-47D Improved Cargo helicopter upgrade for US
Army, possibly to be designated CH-47G
Advanced Chinook - Improved version is CH-47G ship (1000
1000) class replaces, transport roles and additional fuel.

Status

In production

Operators

Argentina (air), army, Australia (army), Egypt (army), army,
Iran (army), Israel (army), Japan (army), Japan (army), Japan
Malaysia, Netherlands, Singapore, South Korea (army), Spain
(army), Taiwan, Thailand (army), US Air Force (US Army)

Manufacturer

Boeing Aircraft Corporation/Boeing Vertol/Boeing Helicopters
USA, Kawasaki Heavy Industries (Japan), Eurocopter
Multinational/Agusta (Italy)



Boeing CH-47 HC HC-1

© Tim Ripley



Boeing CH-47 HC.Mk 2

Tiro Ripley

Boeing 107/CH-46 Sea Knight (USA)

Type: Medium-lift helicopter

Accommodation: Two pilots, crew chief, 26 troops

Development/History

The 107 entered operational service Model 107 made its first flight in 1954 and entered service with the US Marine Corps in 1954. Throughout the 1970s, it was selected to enter an assault role during the Vietnam War. Subsequent problems it developed, the Persian Gulf, Somalia, Liberia and more later with the CH-46 in the middle of the 1990s the upgrade programme kept the aircraft flying through the 1970s, 80s and 90s as the majority of the Marine Corps could not afford to retire the helicopter as it was used to replace the ageing, and increasingly unreliable, CH-43 with the Greyhound. Delays in the 1992 programme mean the 107 will have to soldier on into the 21st century.

US Marine foot support squadrons are large units of the CH-46, operating from shore bases or supply ships. Foreign requests have come in, and will come, for production, being the main one of all activity. One of the more serious requests of the aircraft was made by the Salvadoran Army in 1981. Soviet soldiers arrived by Delta Sea class in the 1980s.

Variants

107 Marine Civilian version.

107-1/CH-46A Improved 107 Marine Corps aircraft with an 1800 hp 54-01-66 powerplant, with extra for 27 to 42500 rpm.

107-46A US Marine 107 with single engine version.
CH-46C Improved US Marine Corps version with 1800-100 hp 107-46A.

107-46B Improved 107 Marine version with 1800-100 hp 107-46A.



Boeing CH-46E Sea Knight

Jim Ripley

Specifications (for CH-46E)

Powerplant

Engine 1 x 1800 hp 54-01-66 107-46A

Power 1740 hp (1270 kW)

Max. Alt. 17,000 ft (5181 m)

Forward speed 110 mph (177 km/h)

Dimensions

Length 44 ft 10 in (13.7 m)

Rotor diameter 44 ft 10 in (13.7 m)

Height 14 ft 10 in (4.5 m)

Performance

Max. speed 110 mph (177 km/h)

Range 300 miles (482 km)

Armaments

Two machine guns

Weights

Empty 11,000 lb (5000 kg)



Bo-46D: US Marine Corps version, 1960s.

CH-46F: Last production version for US Marine Corps, with improved engines.

CH-46E: Improved E- and F-models for US Marine Corps, includes glass, side rotor blades, improved rotors and 150 (3,700) horsepower.

UH-46F: UH version for US Marine Corps.

CH-47 JWA: Japanese-built utility version, exported to South Korea.

Bo-4: Swedish development for Bo-107.

CH-473: Canadian version, Canadian search and rescue version.

CH-473A: Canadian version, Canadian army version.

Status

No longer in production.

Operators

Canada, Japan (Landing Helicopter), Sweden (Army), South Africa (Army), USA (Marine Corps).

Manufacturer

Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing), Boeing (Boeing).

Boeing UH-46D Sea Knight

(The Army)

Boeing/Sikorsky RAH-66 Comanche (USA)

Type: Name: Age: Date:

Accountability was given priority in families

Development/History

The Army's search included several helicopter replacement programs. This received significant backing, but its prospects are still foggy as the service looks for an alternative to replace its aging fleet of UH-60 Black Hawks. The Army wants to keep the UH-60 in service until the late 1990s, while it develops a new design.

The Army also has been looking at other options, such as the Sikorsky HO4S, which was selected last year by the Army's Aviation Modernization Program. The program will replace the AH-64 Apache with a new attack helicopter by 2008. It also will replace the UH-60 with a new utility helicopter by 2010.

Like a museum, has a number of unique features, including a top management of it and demands for work. It is the first step towards the development of a new technology, the emphasis is placed on the scientific, first step is the design.

1999

10

Guidance

[illegible]

Downloaded from

[illegible]

Herring, Gleditsia, and Villavieja Avenue Park



Bochum University of Applied Sciences **BUT-BO** **Germany**

150000 500000

Specifications (for RAH-88)

Proposed work

1. **Laure** : un excellent candidat.
 2. **Précis** : la loi de 1984 est

Discussion

Length: 42 ft 4 in (12.9 m)
Water diameter: 75 in (1.9 m)
Weight: 100,000 lb (45,360 kg)

WE **DO** **IT**

Empty	Partial	Full
0	1	2
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366		

References

Max speed: 274 mph (278 mph)
Range: 240 mi (244 mi) at 150 mph

Argument

[illegible]



Boeing/Sikorsky RAH-66 Comanche

Boeing/Sikorsky

Boeing OH-6 Cayuse/MD500/MD530 (USA)



Model 100SD Defender Lightest version of Cayuse, with 100 hp (75 kW) engine, light armament (20 in. gun/rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher) and 100 hp (75 kW) engine. Used for up to 10 years of flight.

Model 100MD Defender Lightest version of Cayuse, with 100 hp (75 kW) engine, light armament (20 in. gun/rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher) and 100 hp (75 kW) engine. Used for up to 10 years of flight.

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Model 100MD Defender Lightest version of Cayuse, with 100 hp (75 kW) engine, light armament (20 in. gun/rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher) and 100 hp (75 kW) engine. Used for up to 10 years of flight.

Model 100MD Defender Lightest version of Cayuse, with 100 hp (75 kW) engine, light armament (20 in. gun/rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher) and 100 hp (75 kW) engine. Used for up to 10 years of flight.

Model 100MD Defender Lightest version of Cayuse, with 100 hp (75 kW) engine, light armament (20 in. gun/rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher, 200 lb. rocket launcher) and 100 hp (75 kW) engine. Used for up to 10 years of flight.

An OH-6 of the Danish army (APU)

Boeing OH-6 Cayuse/MD500/MD530 (HSA)

Model 500E Revised version with patrol nose, improved tailpilot and Allison 250-C20B powerplant

Alt-500B Urban-bull, version of 500E

Model 500MB Defender, Synthetic training version of Model 500E

Model 500MB Black Ops Urban-bull, military version
M 500B Defender Two-bladed main rotor with fixed pitch nose, powered by Allison 250-C20 turboshaft, rated to 317 shp (235 kw)

OH-6E Special Forces personnel postelectronic warfare version of a Allison 250-C20 powerplant

MH-6E Special Forces version with Allison 250-C20 power plant

AH-6F Special Forces attack version Allison 250-C20 power plant

MD500MG Defender Military version with Allison 250-C20 power plant

MD530 Highlife Night attack version with improved sensors and powerplant

MD530ME Paramilitary Defender Synthetic version powerplant 161 shp (119 kw) and Centre pilot

MD530E Urban/MH-6E Special Forces version of MD500MG version, four gate controls and power plant

A-50 Special Forces attack version of MD530 standard

MH-6 Special Forces version with improvements to MH-6E
AH-6E Special Forces attack version of MH-6E standard



MD500MG on test at Mesa, Arizona (APU)

Boeing MD 520N/Explorer (USA)

Type light utility helicopter

Accommodation: One in two pilots, six passengers

Development/History

The NCRAL is a non-proprietary, open-architecture, performance standard, which has been under development since 1981. As yet it has not been officially adopted by a military arm. Although US Army special forces are understood to have used NCRAL systems.

The revolutionary Boeing Combat Explorer is reported to be in service with the US Army Special Forces.

1000

EN-BA HUMAN: Laparoscopic version, first ever robotic
laparoscopic

MD-400 Experimental version with 60LAR windows (4.4, five-bladed rotor type) and 4-blade 250-CWP 7 testpropeller, Type 1, 333.7 mm (13.53 in).

MD Explorer™ was created by MDAll version 4.0.0.0. MD Explorer is a registered trademark of MDAll version 4.0.0.0.

Mid-Device, Wide-Angle Sample-and-Hold: MDSAH (see Figure 10)

Partnership for Development www.mcd.com

Abstract: While it is true that corporations will be responsible

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References

Overview



Major findings

Hughes Helicopters - 8-0000000 Douglas Helicopter
Dahlgren Naval Air Station, NAS

Specifications (for MD Explorer)

Background

from *Journal of Maritime Law and Commerce*, Vol. 20, No. 1, 1989, pp. 1-14.

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Dimensions

Univariate: 32 (9.4 + 19.9%)

[illegible]

Highlights: 12 76 03 022, 001

1998

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Address: Tel: 020 7463 2200 Fax: 020 7463 2201

English winter along Seattle coast

Post-Test Summary

[Return to Table of Contents](#)

Keywords: child sexual abuse; disclosure; trauma; self-blame

5/10/2007

4000. The rifle has one standard full-length receiver, machine gun pods, two light machine pods.



Boeing AH-64 Apache (USA)



Boeing AH-64 Apache
Haupt

Boeing AH-64 Apache (USA)

At 1980 during process of development Apache helicopters of Hughes from 1986 contract was awarded by US Army in dependence to the helicopter of the same of their programming mission.

The AH-64 is a two-person Apache Helicopter, very well designed for low-level flight and the Apache frequently subject under a lot of fire, which obviously allows for very long range requirements in the flight at night and in low weather. All the US Army Helos will be modified to allow use of the night-vision equipment, and four new Army AH-64s will be developed as well. The Netherlands and Britain are the first export customers for the Longbow Apache to prepare for deployment of the highly capable AH-64. The Dutch have already received a number of old US Army AH-64s to use until new Dutch machines are ready. Boeing is setting up its own production line to produce the AH-64, which will use unique engines, weapon systems and defensive aids. The AH-64 is also a two-person Apache Helicopter, which

Variant 1:

YAH-64/Hughes Model 77: Experimental version

AH-64A: Basic US Army version

AH-64B/C: Improved AH-64 version for Germany army

AH-64D (Longbow): Improved AH-64 with unique version

YAH-64H: AH-64 Apache version with the

Boeing/Pratt & Whitney F135 engine

AH-64E: AH-64 version equipped to allow installation of Longbow radar from the developed (L model)



Boeing AH-64D Longbow Apache

(Boeing)

For an Online Photo tour
See Apache: Proposed new
version.

Status

In service test

Operators

United States Army, United Kingdom,
India, South Korea, Israel,
Mexico, up to 400 AH-64
Army, UK Army, USA
Army.

Manufacturers

Boeing Helicopter
Boeing Helicopter
Boeing Helicopter
Boeing Helicopter
Boeing Helicopter
Boeing Helicopter

Boeing AH-64
Longbow Apache
(Boeing)



Sikorsky S-58 Choctaw/Wessex (USA)

Type: Medium helicopter

Accommodation: two pilots, optional crew chief, 16 troops

Development/History

The first version of the S-58 first flew in 1954, and the US armed forces ordered large numbers until the OH-139s entered service in the 1960s. The British built versions for the Royal Air Force, and extensive service. Westland improved the Sikorsky single-rotor design by adding weight and down-size turboshafts. There are now withdrawing their own version, although a company has recently bought up all the British machines.

Variants (still in service)

Wessex HC 1: RAF use as a troop transport. Also operated by a company.

Wessex HC 3: RAF transport and support helicopter.

Wessex HC 4: RAF transport light AH version.

Wessex HC 5: British version of a company.

QH-14: transport version.

UH-360: transport version.

UH-360: transport version. (Note: not in service)

Status

No longer in production.

Operators

Argentina (in service), UK (in service), Hungary (in service), Taiwan (in service), Thailand (in service), Turkey (in service).

Manufacturers

Sikorsky Aircraft Corp. (USA), Westland Helicopters Ltd. (UK)



Westland Wessex HC.1A.15

Don. Rogers.

Specifications (for Wessex HC 2)

Powerplant

Two General Electric T58-GE-7A

1,000 hp

Power: 2,000 hp (1,493 kW)

Dimensions

Length: 49 ft 4 in (15.05 m)

Length: 35 ft 10 in (10.97 m)

Rotor diameter: 37 ft 6 in (11.43 m)

Height: 16 ft 10 in (5.13 m)

Weights

Empty: 3,000 lb (1,361 kg)

Max. takeoff weight: 7,000 lb

Payload: 1,000 lb (453 kg)

Performance

Max. speed: 140 mph (225 km/h)

Range: 211 mi (338 km)

Armament

7.62 mm (30.06 mm) guns

Sikorsky S-61/SH-3 Sea King (USA)

Type: Multi-mission heavy helicopter

Accommodation: Two pilots (SH-3) four senior operators, 26 troops

Development/History

The Sikorsky design made its first flight in 1959, and the American company made several improvements to its Sea King S-61 before the US Navy ordered a series of trials. After taking the trials into account, a series of tests were run. After testing, and NATO studies ordered it to be built. It took a few American and local production plants.

Working facilities in Britain began to develop a new version from 1960, including anti-submarine warfare, mine warfare, and search and rescue. The new version was built in 1961, and a more than 300 being built in America and Japan.

Variants

YJS-2 Prototype version

JS-2/SH-3A Original US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66. The production version of SH-3B-66 was built with dipping sonar and capable of being converted to the SH-3B-66 version.

SH-3B-66 Some version of SH-3B-66, improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.

SH-3B-66 US Navy production version, and subject of the ASW (ASW), improved by SH-3B-66.



Sikorsky S-3G

US Navy

Specifications (for SH-3H Sea King)

Powerplant

Two General Electric T40-G1 turboshafts
Power: 1,400 hp (1,030 kW)

Payload: 2,000 lb (900 kg)

Performance

Max speed: 160 mph (257 km/h)
Range: 540 mi (865 km)

Dimensions

Length: 41 ft 10 in (12.7 m)
Rotor diameter: 40 ft 10 in (12.4 m)
Height: 11 ft 10 in (3.6 m)

Armament

Mk 44, Mk 45, Mk 46, Mk 47, Mk 48, Mk 49, Mk 50, Mk 51, Mk 52, Mk 53, Mk 54, Mk 55, Mk 56, Mk 57, Mk 58, Mk 59, Mk 60, Mk 61, Mk 62, Mk 63, Mk 64, Mk 65, Mk 66, Mk 67, Mk 68, Mk 69, Mk 70, Mk 71, Mk 72, Mk 73, Mk 74, Mk 75, Mk 76, Mk 77, Mk 78, Mk 79, Mk 80, Mk 81, Mk 82, Mk 83, Mk 84, Mk 85, Mk 86, Mk 87, Mk 88, Mk 89, Mk 90, Mk 91, Mk 92, Mk 93, Mk 94, Mk 95, Mk 96, Mk 97, Mk 98, Mk 99, Mk 100, Mk 101, Mk 102, Mk 103, Mk 104, Mk 105, Mk 106, Mk 107, Mk 108, Mk 109, Mk 110, Mk 111, Mk 112, Mk 113, Mk 114, Mk 115, Mk 116, Mk 117, Mk 118, Mk 119, Mk 120, Mk 121, Mk 122, Mk 123, Mk 124, Mk 125, Mk 126, Mk 127, Mk 128, Mk 129, Mk 130, Mk 131, Mk 132, Mk 133, Mk 134, Mk 135, Mk 136, Mk 137, Mk 138, Mk 139, Mk 140, Mk 141, Mk 142, Mk 143, Mk 144, Mk 145, Mk 146, Mk 147, Mk 148, Mk 149, Mk 150, Mk 151, Mk 152, Mk 153, Mk 154, Mk 155, Mk 156, Mk 157, Mk 158, Mk 159, Mk 160, Mk 161, Mk 162, Mk 163, Mk 164, Mk 165, Mk 166, Mk 167, Mk 168, Mk 169, Mk 170, Mk 171, Mk 172, Mk 173, Mk 174, Mk 175, 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Sikorsky S-61/SH-3 Sea King (USA)

4th - 1st US Navy version

S-61-10: 1st Navy improvement of D-10 model with radio range

4th - 1st US Navy version

S-61-20: 1st Navy improvement of D-10 model with improved avionics systems in 1st US Navy

UH-300: US Navy utility version without ASW mission equipment

SH-300-15: ASW version

SH-300-16: ASW version with improved avionics systems with Sparrowhawk radar

S-61A: export version of D-10 model in 1st US Navy standard

AS-61 A-4: Search and rescue export version for Malaysia, known as R-4

S-61D-2: Brazilian export version to SH-30 standard, later upgraded to SH-30 standard

S-61D-4: Argentinean export version to SH-30 standard

italian-built versions

AS-61 D: Italian version with 1st US Navy standard

AS-61 D-10: 1st US Navy version with improved avionics systems and equipped with Sparrowhawk radar

AS-61 D-15: ASW version with improved avionics systems

AS-61 D-16: transport version, designated AS-61D-16

AS-61 D-17: export version of 1st US Navy standard

Canadian-built versions

CH-300-100: 100th ASW version in SH-30 standard

CH-300-101: improved version with improved avionics systems



Sikorsky SH-30

15 Navy



Westland Sea King HC.604 4 Jungle

Byron Stokings



Westland Sea King HC.Mk 4 - Jungle

(Tim Ripley)

Japanese-built versions

S-61 B, ASW version to SH-3A, later a S-61 B with addition of helicopter gunship war to SH-3 B - standard S-61 A/HM - 10 by, Antarctic version and rescue version

British-built versions

Sea King HAS - ASW version with Rolls Royce Dartone 401 turboshafts rated to 4050 HP - 400 ship
 Sea King HAS 2 - Improved ASW version with a powered rotor - 4050 HP
 Sea King HC 4 - Assault and troop transport version
 Sea King HAS 5 - Improved ASW version with new rotor and improved 401 HP
 Sea King HAS 6 - Improved ASW version
 Sea King HAR 30 - Rescue and rescue version for 101
 Sea King HAR 3A - Improved search and rescue version for 101
 Sea King HAR 5 - Royal Navy designation for its search and rescue version
 Sea King Mk 4X - UK Ministry of Defense work version
 Sea King Mk 41 - Export version of Harrier for search and rescue
 Sea King Mk 42 - Export version for India to 1985 in 1985
 Sea King Mk 42A - Export version for India to HAS 2 standard
 Sea King Mk 42H - Export version for India with upgraded rotor 4040 HP version
 Sea King Mk 42C - Export version for India to HAS 2 standard
 Sea King Mk 43A/B - Export version to Norway for search



Westland Sea King HC Mk 5 'Jungle'

(Tom Ripley)

Sikorsky S-61/SH-3 Sea King (USA)

1961 to 1969

Sea King Mk 45A, Export version for Pakistan to 1963 (24)
upgrading

Sea King Mk 47, Export 1960s version with upgrade to 1970s
standard

Sea King Mk 48, Export 1970s version for Belgium to 1980s (2)
standard

Sea King Mk 50A, Export version for Australia to 1980s (2)
standard

Sea King AER 2A, Attack or early warning version with
four-bladed rotor

Sea King AER 7, Attack or early warning early warning version
with uprated Schiebel rotor

Commando Mk 1 (Sea King Mk 70), Assault and troop
transport version to 1990s

Commando Mk 2 (Sea King Mk 72), Assault and troop
transport version to 1990s

Commando Mk 2A (Sea King Mk 80), Assault and troop
transport version to 1990s

Commando Mk 2C (Sea King Mk 82), VIP version for Qatar

Commando Mk 2H (Sea King Mk 83), Exportable assault
version for Egypt

Commando Mk 3 (Sea King Mk 84), Assault version for
Qatar, used as the base for upgrades

Status

No longer in production

Operators

Argentina (none), Australia (none), Belgium (none), Brazil (none),



Sea King HC Mk 4 'Jungle' over Bosnia

LA photo: Terry Morgan

The SH-3 Sea King has been the largest helicopter family since the late 1950s, with only the Sikorsky HO4S Super Stallion helicopter being larger. It has been used in a variety of roles, including anti-submarine warfare, search and rescue, and transport. The Sea King is a highly versatile helicopter, and its design has been copied by many other manufacturers. The Sea King is a highly versatile helicopter, and its design has been copied by many other manufacturers.

Manufacturer

Sikorsky Aircraft Corp., Stratford, Conn., USA
 (Sikorsky Aircraft Corp., Stratford, Conn., USA)
 (Sikorsky Aircraft Corp., Stratford, Conn., USA)
 (Sikorsky Aircraft Corp., Stratford, Conn., USA)

Westland Sea King
 HC.39 & 'Junglies' in service with the Royal Navy

(Main Production)
 WESTLAND



Sikorsky S-61N-1 Silver (USA)

Type: Passenger transport helicopter

Accommodation: Two pilots, 30 passengers

Development/History

A development of the first King briefly for the US Navy, the helicopter was originally designed as a utility or secondary unit in the transport and rescue work of US operations, but also the model has a relatively important role in South East Asia for the military.

Var ants

S-61: Civil version

S-61NR: Export (nearly civil) version for Argentina

AS-61: AS-1 (Japan-made engine) version for Malaysia

Status

No longer in production

Operators

Armed Forces of the United States, Malaysia and France, 4 (Brazil) (Brazil) (Brazil)

Manufacturer

Sikorsky Aircraft Corp., Stratford, Connecticut



Sikorsky S-61N-1 Silver

Specifications (for S-61N)

Powerplant

Two Turbomeca TP400-T540 1400 hp (1030 kW) each

Powerplant type: Turbomeca TP400-T540

Dimensions

Length: 27 m (88 ft 9 in)

Rotor diameter: 32 m (105 ft 1 in)

Height: 12 m (39 ft 4 in)

Weights

Empty: 2400 kg (5279 lb)

Max TO: 27 000 lb (12 245 kg)

Payload: 2000 lb (907 kg)

Performance

Max speed: 40 mph (64 km/h)

Range: 400 mi (644 km)

Sikorsky S-61/HH-3 (USA)

Type Helicopter

Accommodation 10 people, 4000 cargo, 45000 lbs (20000 kg)

Development/History

Known as the Jolly Green Giant during the Vietnam War, the HH-3E has become the standard search and rescue work by saving the lives of downed helicopter to empty in-flight accidents. Eventually superseded by the bigger S-64, it serves in ASAR service. The H-3E faced a slight standing order work with the US Coast Guard and Rescue Helicopters.

Variants

CH-3E USAF utility and search/rescue version

CH-3E B Helicopter utility-haul search and rescue version

HH-3E Jolly Green Giant USAF combat search and rescue version with in-flight refueling.

HH-3E USAF support version with in-flight refueling

HH-3E Pelican US Coast Guard search and rescue version

HH-3E Pelican AT transport version

Status

No longer in production.

Operators

United States Army, US Coast Guard

Manufacturer

Sikorsky Aircraft (USA), Agusta (Italy)



US Army HH-3E

(APG)

Specifications (CH-3E)

Powerplant

Two General Electric T401-15 turboshafts

Power 2000 hp (1470 kW)

Dimensions

Length 57 ft 1 in (17.4 m)

Rotor diameter 62 ft 6 in (19 m)

Weight 13,000 lb (5900 kg)

Weights

Empty 11,200 lb (5080 kg)

Max lift 27,000 lb (12,247 kg)

Payload 10,000 lb (4536 kg)

Performance

Max speed 162 mph (130 knots)

Range 400 mi (340 km)

Armament

0 in-flight refueling

Sikorsky S-65A/CH-53 Sea Stallion (JSA)

Type: Heavy-lift transport helicopter

Accommodations: six pilot crew, 12 troops, 20 armaments

Development/History

Sikorsky's first bid in 1964, and was quickly upstaged by the U.S. Marine Corps in its heavy assault transport. Some 124 D-models were bought by the Marine Corps, and the first deployment was made in Vietnam. The JSA adapted the aircraft to its principal troop-carrying special operations, and today is the primary helicopter utilized in several approaches to maintain its deep-penetration capability.

Variants

CH-53A: Original JSA/C version powered by General Electric T401-Q1 engines.

TH-53A: JSAF training version similar to CH-53A.

UH-53C: USAF combat search and rescue version with a big refueling system.

CH-53C: USAF major version with out-in-flight refueling gear.

CH-53D: Improved T401 version with updated T401-Q13 engines, replacing a JSA/TH-53A type.

HH-53E: A heavy rescue version powered by two T401-Q13 engines with a big life-supporting system.

HH-53: Pure civil HH-53E special operations version fitted with an inflight refueling, night vision equipment and various electronic, radar and powered by two T401-Q13 engines (a JSA/TH-53A type).

S-65C: 24th American export version built by CH-53C standards, later sold to Israel.

S-65C: Israeli export version similar to USAF HH-53D.



Sikorsky/WH-Fokker CH-53G Sea Stallion serving with the United Nations Special Commission in Iraq after the Gulf War
©Tom Spence

Specifications (for CH-53A)

Powerplant

Two General Electric T401-Q1 34,000-shaft-hp
Powerplant type: Turbine

Dimensions

Length: 62 ft 2 in (19.0 m)
Rotor diameter: 72 ft 3 in (22.0 m)
Height: 24 ft 1 in (7.3 m)

Weights

Empty: n/a
Normal: 11,000 lb (5,000 kg)
Payload: normal 13,000 lb (5,900 kg)

Performance

Max speed: 150 mph (110 km/h)
Range: 270 miles (430 km) with auxiliary tanks

Armament

2 AGM-119 Hellfire missiles



Sikorsky CH-53D Sea Stallion

The Helicopter

Sikorsky S-65A/CH-63 Sea Stallion (USA)

Classed as a heavy transport, capable of a maximum lift of up to 17,000 kg. Designed to transport the M1 Abrams and similarly sized tanks, as well as a variety of other air-transportable equipment. (Classified) transport and recovery.

Status

No longer in production

Operators

Japanese (Army), United States (Army and Navy/Department of Defense)

Manufacturer

Sikorsky Helicopters (USA), OH-60 Crusier (Germany)



Sikorsky HH-63J
Forest Law
AUSAF-Ordn

Sikorsky S-80/CH-53E Super Stallion (USA)

Type: **helicopter** **transport** **assault**

Accommodation: **two pilots, crew chief** **10 seats**

Development/History

The S-80 is the Super Stallion, obtained in 1971 and used to make it one of the most powerful heavy-lift helicopters in the world. The 15 Marine Corps and Navy are in active service in 1980 and some 1,000 were built until production was halted in 1986.

Many other versions used by the US Navy and Marine Corps. Self-Defense Force are operated from amphibious assault ships or shore bases.

Var units

CH-53E Sea Stallion: US Navy and Marine Corps Assault and heavy-lift version

MH-53E Sea Dragon: US Navy mine-sweeping version

S-80B: Japanese export version of CH-53E

S-80B-1: Japanese mine-sweeping version

Status

In service: **in production**

Operator

USA (armed services, government)

Manufacturer

Sikorsky Aircraft Corp.



Sikorsky CH-53E Sea Stallion

Top: [Picture](#)

Specifications (for CH-53E)

Powerplant

Engine: **General Electric T63-2-100 turboshaft**

Power: **1,140 hp (835 kW)**

Dimensions

Length: **73 ft 4 in (22.3 m)**

Rotor diameter: **70 ft (21.3 m)**

Height: **25 ft 1 in (7.6 m)**

Weights

Empty: **11,500 lb (5,217 kg)**

Max. MTOW: **26,000 lb (11,801 kg)**

Payload (max): **14,000 lb (6,350 kg)**

Performance

Max. speed: **145 mph (233 km/h)**

Range: **120 mi (193 km)**

Armament

102 mm or 2.7 inch (70 mm) gun

Sikorsky S-80/CH-53E Super Stallion (USA)



Sikorsky CH-53E Sea Stallion

Top Right



Sikorsky MH-53E Sea Dragon

United Technologies/Sikorsky Aircraft



Sikorsky MH-53E Sea Stallion

United Technologies/Sikorsky Aircraft

Sikorsky S-70/UH-60 Blackhawk (USA)

Type Helicopter

Accommodation Two pilots, crew chief, 14 troops

Development/History

In the early 1970s the US Army began looking for a light Army helicopter which would take into account many of the lessons learnt from combat helicopter operations in Vietnam. Required from both sides was a major reduction in the design, which flew first in 1974.

In the 1970s the US Army began looking for a light Army helicopter which would take into account many of the lessons learnt from combat helicopter operations in Vietnam. Required from both sides was a major reduction in the design, which flew first in 1974.

Variants

UH-60A Upgrade UH-60A with various versions

UH-60A Upgrade UH-60A with various versions

UH-60A Upgrade UH-60A with various versions

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UH-60A Upgrade UH-60A with various versions

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UH-60A Upgrade UH-60A with various versions

UH-60A Upgrade UH-60A with various versions



Sikorsky UH-60A Blackhawk

Sikorsky UH-60A

Specifications (for UH-60A)

Powerplant

Two turbo-propellers, 2x T55-GE-7A

Power 2244 hp (2x1122 hp)

Power 2244 hp (2x1122 hp)

Performance

Max speed 155 mph (250 km/h)

Range 310 mi (500 km), 100 mi (160 km)

Altitude 10,000 ft (3048 m)

Dimensions

Length 48 ft 11 in (14.8 m)

Rotor diameter 53 ft 11 in (16.4 m)

Height 21 ft 10 in (6.6 m)

Weights

Empty 11,200 lb (5080 kg)

Max 17,000 lb (7710 kg)

Armament

162 mm or 12.7 mm door guns and pods, anti-aircraft missiles, etc.

162 mm or 12.7 mm door guns and pods, anti-aircraft missiles, etc.

162 mm or 12.7 mm door guns and pods, anti-aircraft missiles, etc.



Sikorsky S-70 Armed Blackhawk

United Technologies Sensory Aircraft



Following MH-60G Power Movers

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Export roles

- S-70B: 25 Korea Special Forces version with no night refuelling probe and improved T400 T174 engines.
- UH-60M: US Presidential transport version.
- S-70A: 1 Saudi land assault version.
- S-70A-1: Saudi VIP transport/ambulance version.
- S-70A-5: Philippines export version.
- S-70A-12: Australia land-assault version.
- S-70A-17: Australian export version.
- S-70A-2: Japanese search and rescue version, designated JH-40C.
- S-70A-4: Kuwait export version.
- S-70A-6: First and last Polish transport/ambulance PTM-312.
- S-70A-7: Turkish export version.
- S-70A-9: Kuwaiti presidential version, designated 905-20.
- S-70A-3: Egypt export version.
- S-70A-24: Mexican rescue version.
- S-70A-28: Moroccan export version.
- S-70A-29: Iraqi Kamparba version.
- S-70C: Chinese export version.
- S-70: 2 Brazilian presidential helicopter, first helicopter ever used in Brazil.

Status

In production

Operators

Australia (army), Bahrain, Brazil (army), Brazil, China, Colombia (army), Egypt, France, Germany (army), Hong Kong, Japan (army), Korea, Jordan, Malaysia, Mexico,



Sikorsky UH-60L Blackhawk

(United Technologies/Sikorsky Aircraft)

Sikorsky S-70/UH-60 Blackhawk USA

Mission: Full spectrum, air-to-land
Service: Arabia (Saudi, Bahrain,
British Forces), Taiwan (with United
States), Korea, Thailand, Laot, etc.
USA (primary export target)

Main features

Primary support: USA,
Malaysia, Israel, India, etc.
(Japan), Western Hemisphere
(Japan, Korea, etc.) (Taiwan)
Australia, Korea Air Force
Korea

Sikorsky S-70A
Blackhawk of Royal
Brunei Armed Forces
United Technologies
Boeing Aircraft



Sikorsky S-70B/SH-60 Seahawk (USA)

Type: Maritime helicopter Accommodation: Two pilots, six crew specialists

Development/History

Naval version of the S-70 series won the US Navy's JMHF's contract to build a helicopter and first test in 1974. The SH-60B has 83 per cent commonality with the AH-64, it includes many features necessary for a maritime mission including anti-corrosion treatment for the airframe, improved engines and a HMMT gearbox driven to rotate the rotor to a rolling ship deck or figure-eight. The US Navy has contracted to develop the third stage including a wide submarine rescue hoist dunking system and a specialized mission search and rescue system. More air time is said to be awarded for the first under the SH-60A programme.

Status

in production

Variant is

- SH-60B Seahawk: Original US Navy high speed purpose built AH-64, US III Corps, no production rotorcraft version with 4050-24 rotor, MWG and windows, radio-link system.
- SH-60F Oceanhawk: Current version, all aspects of a combat helicopter, including wide forward dragage, arm and production Agave III components.
- S-70B: US Army version, not considered a SH-60B.
- SH-60C: US Navy programme to standardise S-70 and F versions.
- S-70B-2 BAHF: Army version with standardised propeller, gear, landing gear, other systems, fire protection for Sea King and Puma, rotor speeded anti-slip wheels.



Sikorsky S-70B-2 Seahawk of Greek Navy

(Latest Technology/Seaspray Aircraft)

Specifications (for SH-60B)

Powerplant

Two General Electric T62-GE-400 turboshafts
Power: 2600-shp (2014 kW)

Max T/O: 104,000 lb (47,000 kg)

Forward: 100

Dimensions

Length: 56 ft 10 in (17.33 m)
Rotor diameter: 55 ft 6 in (16.91 m)
Height: 12 ft 11 in (3.94 m)

Performance

Max speed: 140 mph (225 km/h)
Range: 150 and 152 miles (241 and 244 km)

Armament

1,000 and 12.7 mm machine guns, AGM-119C rocket anti-air missiles, Mk 44 or Mk 56 torpedoes, mine-flight system.

Weights

Empty: 13,640 lb (6187 kg)



S-70B — Seahawk (US Navy version of SH-60) (also manufactured as ship intelligence gathering helicopter)

SH-60B **Rescue Hawk** — A Navy generalised version of S-70B, also known as S-70B, was a multi-mission all night amphibious attack helicopter. It is one of the most used in our version.

S-70B-2 **Fire support version**

S-70B-3 **Fire support version with F100-600 engines**

CH-60 **Proposed** — A Navy utility version for amphibious assault operations.

Wapiti Hawk — Proposed Canadian rescue version.

Operators

Australia (navy), Germany (navy), Japan (navy), Spain (navy), United States (navy), USA (navy) (navy).

Manufacturers

Boeing Helicopters, Bell Helicopters, Sikorsky Helicopters, Bell Helicopters, Bell Helicopters.

Sikorsky SH-60B Seahawk

Advanced Technologies
Sikorsky Aircraft



Sikorsky SH-60B Seahawk

(United Technologies/Sikorsky Aircraft)

Sikorsky S-76 (USA)

Type: Medium-lift utility helicopter

Accommodation: Two pilots, 14 passengers

Development/History

This private venture product has sold well as a number of civil and military customers around the world, but it has not found favour with the US armed forces.

Variants

S-76: Original version powered by Allison 250-C30 turboshafts, rated to 485 kW (660 shp).

S-76 Mk II: Improved version.

S-76 UH11g: Basic version.

AUH 76: Armed utility derivative, with provision for anti-aircraft rockets and guns.

S-76A/C: Version with S76B/C (601 shp) Turbomeca Arriel (51) powerplant.

S-76B: Production version with P16B-36A powerplant.

H-76B: Military version of S-76B, with weapons provision.

H-76B: Naval version.

HE24: Spanish designation.

Status

In production.

Operators

Chile (army), Guatemala, Honduras, Hong Kong, Iraq, Japan, Jordan, Philippines (air force), Spanish Air Force, South Korea (army).

Manufacturer

Sikorsky Aircraft (USA) and Daewoo (Korea).



Sikorsky S-76C

(United Technologies/Sikorsky Aircraft)

Specifications (for H-76)

Powerplant

Two Pratt & Whitney Canada P16B-36A turboshafts.

Power: 1562 shp (1144 kW)

Dimensions

Length: 44 ft (13.4 m)

Rotor diameter: 44 ft (13.4 m)

Height: 14 ft 5 in (4.4 m)

Weights

Empty: 5041 lb (2282 kg)

Max T/O: 11 700 lb (5307 kg)

Payload: n/a

Performance

Max speed: 170 mph (287 km/h)

Range: 257 nm (464 km)

Armament

7.62-mm, 12.7 mm or 20 mm machine gun pods; Stinger air-to-air missiles; Hellfire laser-guided missiles; TOW wire-guided anti-tank missiles; free-flight rockets.

Glossary

ABW Airborne early warning

ASW Anti-submarine warfare

ASW Anti-surface vessel warfare

ASW Anti-submarine warfare

avionic Avionic electronics, such as communications radio, radar, navigation systems and computers

carbon fibre rotor blade in which

flapping, twisting and pitch change movements are provided by the flexibility of the structural material and not by bearings. No rotor is rigid.

carbon fibre fine filament of

carbon-graphite used as strength element in composites.

CAS Close air support

CAU Cluster bomb unit

CFRP Carbon fibre-reinforced plastic

CI-101 Counter-intrusion

comint Communications intelligence

composite material Made of two constituents, such as filaments or short subfibres plus polymer, having differing matrix

data bus Electronic highway for passing digital data between aircraft systems and weapon projections, usually MIL-STD-1553B or ARINC-634 (see **mil**) and RS-170 (see **mil**) systems.

derived engine derived to power loss. First derived to maintain basically such engine is lost rated.

EF Electric Fan in electric fanless, Electric Fanless fan rotor with many smaller blades rotating in short slot

FLIR Forward-looking infra-red

fly-by-light Flight control system in which signals pass between computers and actuators along fibre optic leads.

fly-by-wire Flight control system with electrical signalling (ie, without mechanical interconnection between cockpit flying controls and control surfaces).

g Acceleration due to mass Earth gravity (ie, of a body in free fall), or acceleration due to rapid change of direction of flight path.

GPS Global Positioning Systems

gunship Helicopter designed for battlefield attack, normally with one body carrying pilot and weapons operator only.

hardpoint Reinforced part of aircraft to which external load can be attached, eg, weapon/fuel tank.

HMD Helmet-mounted display, former

HMS = sight

hot and high Airborne combination of airfield height and high ambient temperature, which together required take-off distance (TOD)

hp Horsepower

HUD Head-up display

IFF Identification friend or foe

IR infra-red

IRSI Infra-red search and track

J-5100S US Air Force/Army Joint Surveillance Target Attack Radar System in Boeing F-15A

JIDS Joint Tactical Information Distribution System

Kebar Aramid fibre used as basis of

high-strength composite material.

knots Kilometers per hour

km Kilometers, the metric unit for measuring power output of jet engines. About 1.34 hp per hour.

kN Kilonewtons, the metric unit for measuring power output of a propeller-driven engine.

kg Pounds of static thrust, the measurement of a jet engine's static thrust.

LLTV Low-light TV (also LLTV, low-light-level)

low observables Materials and structures designed to reduce aircraft signatures of all kinds.

in extended, the metric unit of length.

MAD Magnetron anomaly detector

MDD Multi-direction display

MMS Multi-manual sight

MO Maximum permitted operating

Mach number

mph Miles per hour

MaxRO Maximum take-off weight

nm Nautical mile, 1.15077 miles (1.1547

nm)

NOI Out-of-the-Clouds (ie, flying in military aircraft using natural cover of hills and trees etc).

NOI Night Vision Goggles

optics Combination of optics and electronics in viewing and sighting systems.

port Left side, facing forward.

push Structure fitting aircraft to external load (engine mounts, drop tank, bomb etc).

radius The distance an aircraft can fly from base and return without immediate landing.

RAM Radar absorption material

rigid rotor see **helicopter rotor**

RPV Remotely-piloted vehicle

SAR Synthetic aperture radar

sig Signal horsepower, measure of power transmitted via rotating shaft

sigint Signals intelligence

signature Characteristic "fingerprint" of all electromagnetic radiation (radar, IR etc)

single-shaft Gas turbine in which all compressors and turbines are on common shaft rotating together.

SLAR Side-looking airborne radar, stabilises the Q box, horizontal stabiliser = tailplane

starboard Right side, looking forward.

t Tonne, 1 Megagram, 1000 kg

tilt-rotor Aircraft with fixed wing and rotors that tilt up for hovering and forward for fast flight.

T-O Take-off

ton Imperial (long) ton = 1.016 t or 2240 lb; US (short) ton = 0.907 t or 2000 lb

turboshaft Gas turbine in which as much energy as possible is taken from gas jet and used to drive helicopter rotors.

UAV Unmanned air vehicle

weight Small auxiliary control, usually sharply tapered and often sweptback, at tip of wing.

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